THE MARINE REVIEW

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COLUMBIA-SAN PEDRO COLLISION.

Three men are held responsible for the collision between the steamers Columbia and San Pedro, off the rocky Mendocino coast, on Sunday morning, July 21, by the decision of United States Supervising Inspector John Bermingham, rendered last week. Capt. Peter A. Doran of the Columbia, who went down with his ship, the master of the San Pedro, Magnus Hansen, and B. Hendriksen, the chief mate, are the men upon whom the blame for the terrible catastrophe is fixed. Hansen is suspended for one year and Hendriksen for five years.

Capt. Bermingham scored the dead captain, and recommended the passage of a law that would make those responsible for such accidents guilty of manslaughter. He says in his opinion that if the Columbia and similar vessels were provided with watertight bulkheads there would be no danger of their sinking. The inspector says on this point:

"The bulkheads of the Columbia were placed in her in conformity with the law, which, in my judgment, needs revision. A water-tight bulkhead extending up to her main deck and 50 ft. abaft her collision bulkhead would have saved the ship and all on board."

Third Mate Hawes of the Columbia is exonerated by the inspector from any charges of cowardice, and he gives it as his opinion that the charge that Hawes was addicted to narcotic drugs was false. After a careful review of the wreck, the incidents connected with it, a digest of the testimony of the surviving officers of the ship and of the passengers, Captain Bermingham says:

"After a careful consideration of the evidence in this case, I find that Captain P. A. Doran, in charge of the bridge on the Columbia, and Chief Mate B. Hendriksen, in charge of the watch on the San Pedro, each hearing the fog whistle of the other about five minutes before the collision—the Columbia, a little on her starboard bow, and the San Pedro, a little on her port bow—glaringly violated the second paragraph of article 16, of the International Rules of the Road; and rule XV of the Pilot Rules, a copy of which is placed under glass in the pilot-house of every steam vessel. Each of these rules is identical in language, and reads as follows:

"A steam vessel hearing, apparently forward of her beam, the fog signal of a vessel the position of which is not ascertained shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

"Could anything be plainer than that language for the guidance of a navigator? Its observance would have averted that collision and its consequences. Each vessel was driven blindly in a fog, absolutely regardless of human life. Bad as was the navigation of those vesels, had Hendriksen kept his course the collision would not have occurred. He is the only remaining direct perpetrator of that horrible catastrophe and deserves vastly more punishment than I am authorized to give him.

"It is plain that a law should be enacted providing for the trial of offenders in such cases for manslaughter. Be that as it may, I hereby, under authority conferred upon me by section 4450, U. S. Revised Statutes, revoke the license as master of ocean steamers, 1000 gross tons, issued to B. Hendriksen for five years on June 22, 1905, for negligence and unskillfulness and a flagrant violation of the rule above quoted:

"I further decree that after the above named license shall have expired, namely, June 22, 1910, no local board in this district will be justified in issuing to him any grade of license before Sept. 1, 1912.

"Capt. Hanson testified that he went to his room at 9:30 that night, where he remained until the time of the collision. He left orders with the second mate 'to call me if it got foggy, and not to crowd anybody—that is, vessels—and to give everybody plenty of room, as we had the whole ocean before us.'

"Fog set in about 11.30 P. M., and the second mate did call him and reported foggy weather, but the captain did not come out of his room. There was no night order book in the pilot-house to convey orders to Hendricksen, the relieving officer, who merely received the course from Shaube at midnight. There were no orders to call Captain Hanson if the fog whistles from another vessel were heard. The captain thought that the orders given verbally to Hendriksen and Shaube, the new mates, about three weeks previously were sufficient. 'On my first trip with the new men I told them in case it was necessary in emergencies to slow down and stop, without being specially instructed by me to do so.'

"Capt. Hanson was negligent in not giving more definite orders to his mates as to the navigation of the San Pedro during foggy weather. Hence he is in a measure responsible for the collision and the loss of life resulting therefrom. He did not instruct his officers to observe implicitly the requirements of the rules when navigating in a fog. Besides, it appears to me that he was negligently indifferent to the navigation of his vessel that night after being notified by the second mate of the existence of fog. His

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idea about 'giving everybody plenty of room' was practiced by Chief Officer Hendriksen when he put his helm to port with such dire results.

"Therefore I hereby, under authority conferred upon me by section 4450, United States Revised Statutes, suspend the license of Magnus Hanson, master ocean steamers 1500 gross tons, and master sail vessels, for a period of twelve months from and after August 31, 1907; and it is so ordered."

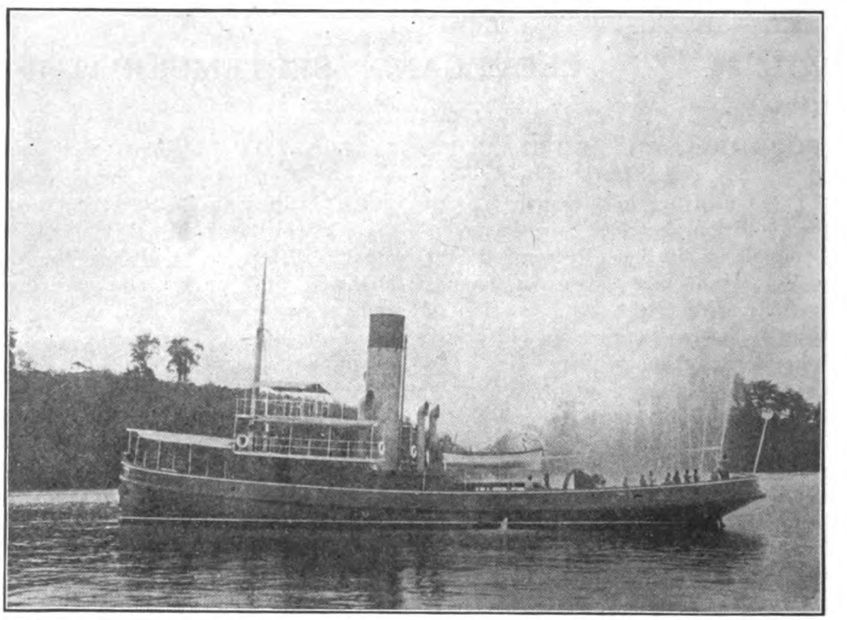
The damage sustained by the San Pedro, according to Captain Bermingham, and her salvage, will reach approximately $25,000; and the approximate loss of her deckload of lumber $5,000, in all about $30,000. The value placed on the Columbia by the owners was $325,000, and the estimated value of her cargo $175,000 the total, in round numbers, $500,000.

COMBINED TUG AND SALVAGE STEAMER.

A steel twin-screw tug boat named the Varuna, which is fitted up for fire and salvage purposes, has recently been built and engined by the Tanjong Pagar Dock Board, Singapore. The principal dimensions of the vessel are: Length, overall, 128 ft.; breadth molded, 25 ft.; depth molded, 13 ft. The hull is built of steel throughout, the scantlings being in excess of Lloyd's highest class. The vesesl has a steel main deck, teak sheathed aft of machinery space, and raised forecastle deck the height of the bulwark. Accommodation is arranged for twelve Europeans in two deck-houses, one on the main deck forward, and one on the lower bridge. There is space for forty natives in the forecastle, and quarters under main deck aft.

The double bottom of the hold and fore and after peaks is arranged for fresh water, or trimming, tanks. There are five water-tight bulkheads, the machinery space bulkheads having water-tight doors, which can be worked from the deck. Coal is carried in side bunkers the whole length of boiler space and in a reserve cross bunker forward, the total capacity being 110 tons. There is a steel mast forward, which is fitted with a 10-ton derrick for salvage gear.

Sentinel combined steam and hand-steering gear is fitted on the bridge deck, and is provided with a controlling rod carried to the flying bridge. Emerson Walker's patented steam and hand windlass and capstan are fixed aft for handling heavy tow-lines. The propelling mchinery consists of two sets of triple-expansion surface condensing engines, capable of developing collectively about 1,100 indicated horsepower. The cylinders have diameters of 13½ in., 22 in., and 36 in., with a stroke of 22 in. The engines are fitted with steam reversing gear. The auxiliary machinery consists of one duplex Worthington pump for the water tanks and bilges, two centrifugal circulating pumps, two duplex Worthington feed pumps, and a Rankine feed-water filter. In addition to the foregoing, there is one Merry-



COMBINED TUG AND SALVAGE STEAMER.
The Tanjong Pagar Dock Board, Singapore, Builders.

weather pump, with complete fire and salvage connections, capable of discharging 1,800 gallons per minute. The above illustration shows this pump at work delivering water through a number of fire nozzles. A direct-coupled dynamo, by Scott and Mountain, is fitted for lighting the ship. Steam for the main and auxiliary engines is supplied by two cylindrical return tube boilers, each 13 ft. in diameter, with a working pressure of 180 lb.

The Halifax Dry Dock at Halifax, N. S., promises to be a busy scene during the present month. The Swedish steamer Oscar II. is expected to be off the dock by the middle of the month and then the steamer Universe, which is at present lying at the pier—kept afloat by powerful pumps—will be put in the dock. The repairs to the Oscar II amount to $23,000 and those to the Universe are to bring $60,000. The steamer Turret Bell, which has been ashore on Prince Edward Island, is also expected at this dock for repairs.

THE FIGHTING TEMERAIRE.

Once again—for the fifth time—the British navy will possess a Temeraire. On Saturday, Aug. 24, the second of the three sister ships to the Dreadnought was launched at Devonport and christened with the historic name of Temeraire by Countess Fortescue. It was on New Year's day that Lady Beaumont laid down the first keel plate of the leviathan now almost ready to take the water, so that a monster first class battleship hull has been constructed in something under eight months.

While a "sister" ship to the Dreadnought, the Temeraire will be a bigger sister, not so much in length and breadth—they are both 490 ft. long and possess a beam of 82 ft.—but as regards tonnage. The new vessel will be of the displacement of 18,600 tons, which is 700 tons more than the Dreadnought, while her draught is half a foot more. These figures are the same as those of the Bellerophon, which was launched last month, and the figures of the other vessel which is still on the stocks, and which is to be christened Superb, will be identical. The improvements on the Dreadnought embodied in these three new vessels are the result of the experience gained by authorities on board the first great vessel of this type. The speed of the Temeraire and her sister ships is 21 knots, with a horsepower of 23,000, but, while the Dreadnought proved herself capable of exceeding that speed, it is doubtful whether the later vessels will do so

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owing to the increased displacement. The improvements include two additional guns to fire astern, a change from the 27 12-pounders to the same number of 4 in. 25-pounders, and a simplification in the handling of the propeling machinery. Part of the increased displacement, it is said, is accounted for by an increase of defensive armor, although no official information on that point is forthcoming.

The sister ships all bear historic names, but of the three the Temeraire is the one that Englishmen know most intimately, and never weary of repeating. The name entered the British navy attached to a captive from the French in 1694, and her successor was secured in the same manner sixty-five years later. Then came the Temeraire, the "Fighting Temeraire," from which Turner produced his masterpiece of pathos. The whole world knows that scene of the fussy little tug drawing the stately ship of the line to the breaker's yard, with the golden glory of the west behind. Of the "Fighting Temeraire" it has truly been said that Trafalgar was her day, but that autumn evening when she made her last trip from Sheerness to Rotherhithe was also a great day for her.

"Now the sunset breezes shiver,
And she's falling down the river,
But in England's song for ever
She's the 'Fighting Temeraire.'"

One hundred and nine years ago, almost to a day, the predecessor of the great battleship of today was launched amid wind and rain at Chatham. She was built of British oak from Hainault Forest, and took over five years to build, and, like her successor of today, was "one of the finest ships that we have even seen," as an officer of that period wrote. At Trafalgar the Temeraire had the post of honor in Nelson's line, while the Bellerophon—"Billy Ruff'n," as her men style her—was one of the leading vessels in Collingwood's line. The love Nelson's officers had for him was shown when Captain Blackwood begged him to let the Temeraire pass the flagship and lead into battle, so as to draw off some of the enemy's fire. "Oh, yes," said Nelson, "let her go ahead if she can." She could, and did, and when Nelson saw it he ordered her astern again, for he was in no mood to see his flagship passed.

RECORD OF GLORY.

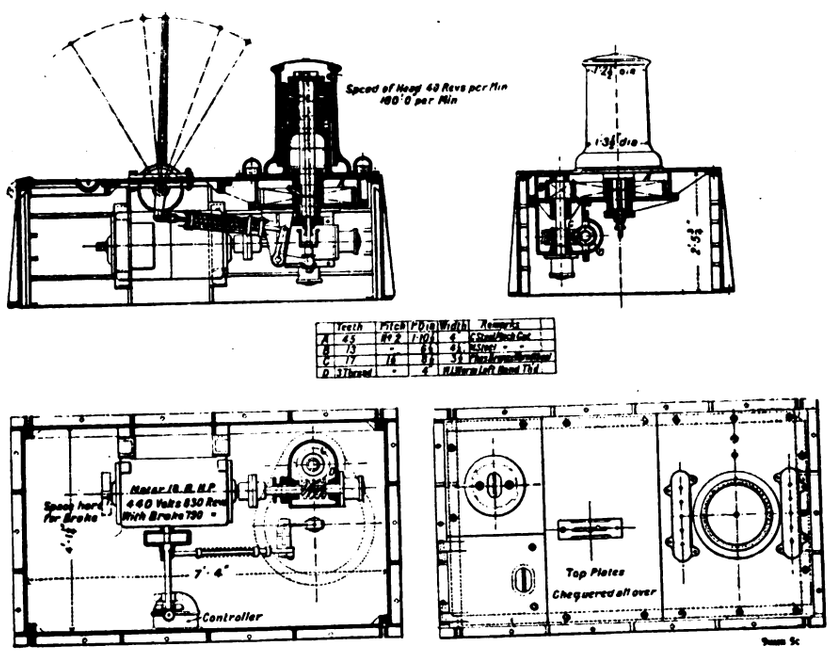
The history of the deeds of the Temeraire is too long to recount here—how she virtually rescued the Victory from certain capture, herself captured two 74-gun ships, then lost both in the storm which followed the battle. The cost to the gallant ship was 123 killed and wounded, and the state of the vessel herself was so bad that Captain Harvey expected her to founder. But her fighting days were far from numbered. For six years longer she fought England's enemies, her last shotted guns being fired in Hyeres Bay, where her broadside practically cleared out an entire battery. Six months later she was paid off at Plymouth, and in 1836 she served as Guardship of Ordinary in the Medway. On August 18, two years later, she was sold for £5530, "all standing," and so came to her appointed end.

The fourth Temeraire was an ironclad, and was built at Chatham in 1876. She was the first British vessel to have guns mounted on the disappearing principle, and is today used as part of the Mechanician School at Devonport, after having done good service at Alexandria.

ELECTRICAL CAPSTAN.

A capstan, designed and patented by Walter Dixon and George Baxter, and adopted by the Clyde Navigation Trustees after exhaustive test, is shown in the accompanying engraving. The principal feature of the capstan is that the head is not fixed to the spindle but is connected thereto by a clutch sliding upon the upper end of the spindle inside the capstan head. When the gear is at rest the head is loose upon the spindle and a wire rope fixed to it can therefore be used, a positive pull being obtained as soon as the head revolves, thereby avoiding all losses due to current consumption when the head is running light at starting. Moreover, as the rope is fixed there is said to be no slipping and grinding action upon the head as where loose hemp ropes are used, and the head may be made of cast iron without fear of wear.

The makers, Messrs. Stothert & Pitt, of Bath, represent that comparative tests of this capstan have shown an efficiency under varying loads of from 42 per cent to 78 per cent as compared with from 10 per cent to 32 per cent of a standard hydraulic capstan, and that from a large number of observations taken, it has been found that the standard capstan using a loose rope makes three times the number of revolutions of the capstan now under consideration to perform the same work, owing to the large number of useless revolutions of the former when the rope is not on the head or is slipping. Comparative current consumption curves show a reduction of 25 per cent in favor of the Clyde capstan as against a standard electric capstan with fixed head, and a reduction of 50 per cent in the peak of the load demand upon the generating station.



SECTIONAL DRAWING OF ELECTRICAL CAPSTAN.

The advantages claimed for the design by the makers are: (1) An economy of 25 per cent; (2) maximum demand upon generating station reduced by 50 per cent; (3) fewer revolutions, and consequently longer life; (4) one

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hand only needed for driving, as against one foot and two hands, and no discomfort to the operator owing to drip from ropes; (5) great saving in cost of ropes, one wire rope fixed to a Clyde capstan will last two years or more; (6) no wear upon capstan head; (7) reduction of repairs to a minimum.

HARBOR OF MANZANILLO.

The Republic of Mexico has probably spent more money in opening new or perfecting existing ports, than any country of its size and population in the world. It has always been part of the policy of President Diaz to provide the necessary funds for this important form of enterprise, and as evidence of the energy with which it is pursued it may be said that quite recently the Mexican government undertook to expend no less than £6,500,000 on new port works, this being in addition to what had already been expended, which may be put at another £5,000,000 or £6,000,000. Among the more important undertakings of this character are the port works of Manzanillo.

Manzanillo is a great natural harbor, but in order to render it suitable for the accommodation of ships, and to afford them shelter and protection during storms, it was necessary to enclose it more securely, constructing a breakwater as an extension of a natural promontory, sheltering the harbor on the west side, while, to provide safety during loading and unloading cargoes, extensive sea walls had to be built within the tranquil area of the harbor.

The waters of the neighboring laguna, having no connection with those of the ocean, except, perhaps, through the medium of occasional overflows resulting from the prevalence of storm-tides in the ocean, during the dry season evaporate rapidly, exposing the bottoms and margins of the laguna to a depth of more than one metre below its flood-line level. The heat of a tropical sun beating on these areas of saturated and decomposing animal and vegetable matter, have in the past given rise to an intensity of pestilential effluvium which, poisoning the atmosphere by the extent of surface over which it is generated, has been borne through the whole locality by every wind and breeze which blows from southwest to east and northeast. Therefore as a preliminary measure sanitary works had to be undertaken, and these necessarily occupied a considerable time.

The plan was simple and yet effective. It was decided to flood the pestilential marshes with fresh-water from the river Arenas, and with tide-water from the sea. In order to do this, a dam and a canal had to be constructed, the former being known as Tepalcates and the latter as Ventanas. The canal introduces and discharges about one-fourteenth of the volume of water impounded in the lagunas during the rise and fall of each tide, while the dam divides the larger lagoon for the purpose of protecting the salt industry of Cuyutlan, which is situated on its western shores, thus effecting an enormous improvement.

Apart from its low latitude and climatic disadvantages, Manzanillo would almost appear to have been chosen by nature for the great port of Mexico's western provinces, and there are those who believe, with good reason, that Manzanillo may yet become the San Francisco of Mexico. It is 861 kilometres distant from Mexico City and, when the railway now being constructed by the Central is completed, it will take but 24 hours to reach Manzanillo from the capital city. The writer spent some two weeks in Manzanillo examining what had been done, and the intentions of the government of Mexico were explained to him. New contracts have been signed with the Minister (Senor Fernandez) of the department of public works for the final completion of the breakwater, while a sufficient assignment has been provided for continuing the work of general improvement of the harbor, including a large amount of dredging. All this will be undertaken during the current year, and it is the express intention of the government to continue the same annually until the entire work is finally completed.

The most important and expensive part of the Manzanillo construction has been the breakwater and sea-walls. The writer believes he is correct in stating that the Manzanillo breakwater is the heaviest that has ever been built, exceeding in both height and width the proportions of the great sea walls at Plymouth and Cherbourg. No less than 1,500,000 tons of blue granite from the Colomo quarries, which are, fortunately, close by, were employed, the greater portion being sunk for the foundations of the breakwater. This breakwater extends a distance of 600 metres (1,968 ft.) into water 18.5 metres (60 ft.) deep. It is unnecessary to point out how costly such a work as this would be anywhere; but at Manzanillo, where cement costs 45s. per barrel, laid down at the port, and labor is both expensive and unskilled, the cost of the undertaking was enormously increased. Stones of varying sizes from 2.5 to 3 tons form the foundation of the breakwater, and these, when quarried, were conveyed on railway flat cars to the brink of the sea, and there allowed to fall, the traveling steel crane in use being capable of handling 50-ton blocks at a time. On the seaward side the breakwater is protected by huge blocks of granite weighing 30 tons each, while on the inner side the blocks weigh from 3 to 15 tons, and those destined for the lower slope from 10 ot 25 tons each.

Four years were required to bring the work on the breakwater to a point where the crown of cement concrete could be put in place. For this the government engineers passed very stringent rules, and every portion of the work, as well as all the material used, had to pass their closest test. As in the case of the famous Galveston jetties, the sea slope of the surface of the breakwater at Manzanillo, covered with its granite coating, presents a resisting obstruction to the waves which slide over the masonry wall, and during the prevalence of heavy storms and high seas expend the energy of their impact obliquely, displacing no materials, the great weight of the blocks and the solidity of the surface resisting the immense force of the seas.

The Manzanillo harbor covers about 160 acres, and is one of the most secure and convenient for shipping to be found in the world. Here a hundred sea-going vessels may ride at anchor with the most perfect safety. From the inner end of the breakwater a sea wall, or, as it is called in Spanish, "malecon," has been built out for a distance of two kilometres along the line of beach. Here also will be constructed the splendid range of wharves which the Mexican government will build and equip, and which will have a total frontage of five kilometres. This sea-wall, like the breakwater, is of the most solid construction, being of blue granite throughout, and rising three metres above mean tide. At the back of the wall the space is filled in with immense stones. In addition to these two walls the contractor was called upon to dredge the anchorage grounds and the western part of the harbor to a depth of 8.5 metres below mean tide, which depth will probably be increased to 12 metres.

If Manzanillo port and harbor has cost a great deal more than the government intended to spend, it will, in the opinion of the writer, amply com-

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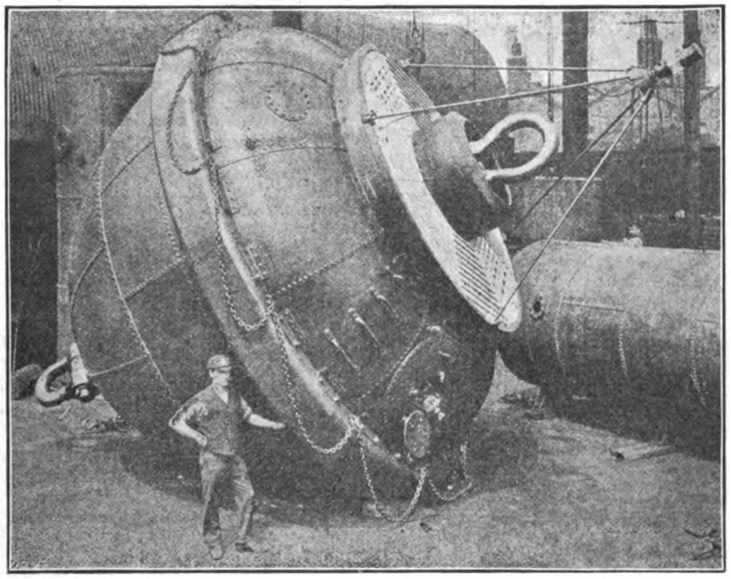

FIG. 1.—THE BUOY IN THE BUILDERS' YARD.

pensate the republic for its outlay. Not only is the present harbor exceptionally well designed, but the work put into the construction is so excellent that its permanency is a matter of absolute certainty. Indeed, the breakwater has already proved of service in relieving the harbor of swells, which were formerly one of its main characteristics.

MOORING BUOY FOR LUSITANIA.

Owing to the great size and weight of the Lusitania and her sister ship, it has been found necessary to design special moorings for their accommodation in the Mersey. As the buoy for this mooring is the largest that has ever been made, a description of it is of interest.

The buoy has been supplied by Pintsch's Patent Lighting Co., of 38 Leadenhall street, E. C., London, and has been constructed under the supervision of that company by Messrs. John Bellamy, Ltd., of Byng street, Millwall, E., London.

The buoy is 16 ft. in diameter over the plating by 14 ft. deep, and is constructed of Siemens-Martin mild steel, having an ultimate tensile strength of 28 tons per square inch. The plates are ⅜ in. thick, and the rivet holes are slightly countersunk on the outside and the rivets nobbled over and pointed in the usual Admiralty fashion. Complete with all fittings, it weighs 16¾ tons, and has attached to it 16 fathoms of 4¼-in. stud-link cable chain. When coupled to the moorings it has a displacement of 865 cu. ft.

The spindle was forged from a solid ingot by the Darlington Forge Co., and with the mooring shackles attached weighs 3 tons. The shackles and pins were also made by the same firm. The joint between the spindle and the buoy at the bottom end is of special construction, as the Cunard company specified that it must be made water-tight. It will be seen that a cast steel rubbing plate, A, is riveted to the bottom of the buoy. The collar at the bottom end of the spindle, C, is screwed, and a tight-fitting ring nut, B, is threaded on to this, and screwed hard down on the face of the rubbing plate; a brass channel ring, D, containing a rubber ring, E, being placed between the two. The joint between the spindle and the buoy at the top is made like that between two pipe flanges.

The lantern which the buoy carries is one of a special type made by

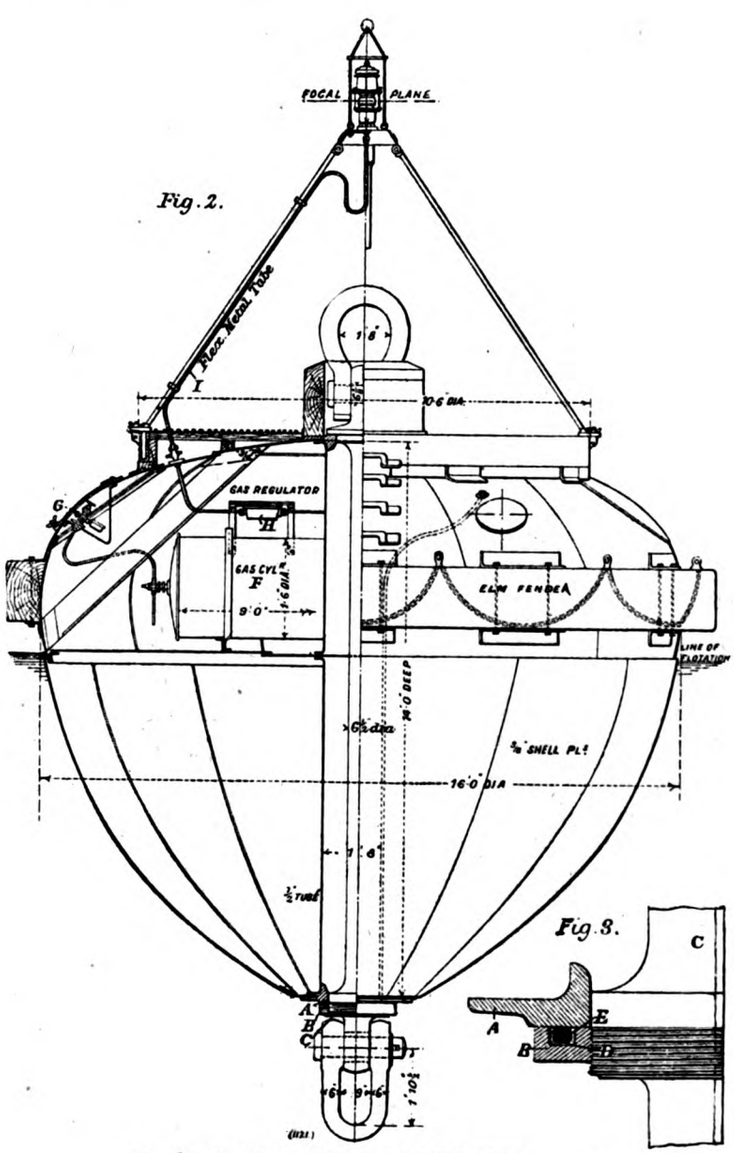

FIG. 2.—DRAWING OF THE MOORING BUOY.

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Pintsch's Patent Lighting Co., and has a 4-in. dioptric lens, fitted on a specially designed superstructure which can be disconnected and removed in a few minutes when it is necessary for the ship to make fast. The lamp is supplied with gas from cylinders F contained within the buoy, and the cylinders are easily charged with gas through the filling valve, G, which is contained in a pressed steel pocket, all the joints being made tight, so that no water can enter the buoy. There are two gas cylinders, each 9 ft. long and 30 in. in diameter, and they are capable of supplying gas to the lamp for a period of one month. The gas passes from the cylinders through the regulator, H, and along the flexible tube, I, to the lamp. When the superstructure has to be removed, the gas can be shut off by a cock and the flexible tube disconnected.

ACAPULCO'S CASE.

The Pacific mail steamer Acapulco turned turtle while loading at her dock at San Francisco recently. Steamboat inspectors Bulger and Bolles, of San Francisco, upon investigation fixed the finding for this accident upon First Officer J. P. Pedersen, as follows:

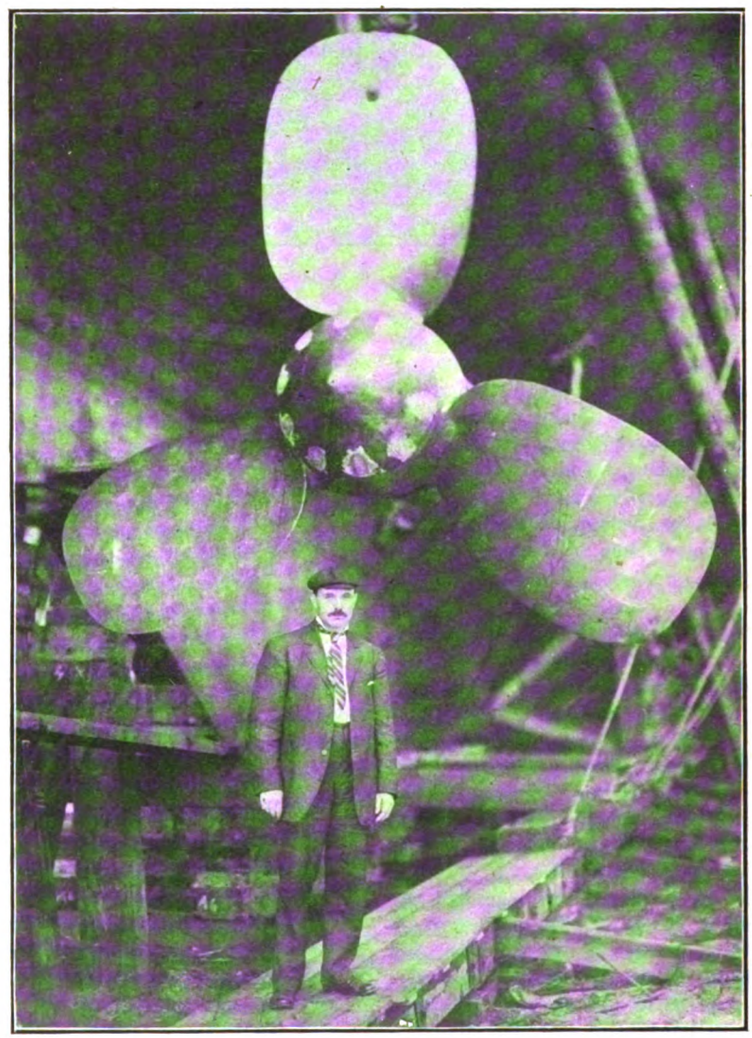
"That J. P. Pedersen, chief mate, was negligent in allowing so much heavy freight to be stowed on the starboard side of the steerage deck when coal was being stowed toward the same side. During the whole of the time he knew that the vessel was tender, because he said he had spoken to the stevedore and had cautioned him to keep the vessel upright. Knowing the condition of the steamer, he should not have allowed the cargo to be stowed on the steerage deck and starboard side until the coal port was closed. For such negligence we suspend his license for six months."

An extensive shipbuilding scheme is proposed by the Spanish government, providing for the reconstruction of the Spanish navy and government yards. The scheme of new works at the ports of Ferrol, Carthagena, and Carraca (Cadiz) will involve an expenditure of £647,000, and £6,200,000 is required for other works and new ships of war, the total contemplated expenditure amounting to about £7,225,000. Foreign aid is to be sought for the execution of the shipbuilding program, but under conditions calculated to interfere as little as possible with the employment of Spanish materials under Spanish supervision.

CAPT. T. E. EVANS.

Capt. T. E. Evans has been appointed port captain of the Fore River Ship Building Co. at Quincy, to take charge of vessels on trial trips and for such duties on the manager's staff as may be assigned him, in the care and preservation of the company's property both in the yard and on vessels afloat. Capt. Evans is one of the best known ship masters of Boston and is perhaps best remembered as captain of the tug boat Confidence of the Boston Tow Boat Co.'s fleet. He is known all up and down the Atlantic seaboard. This appointment brings Capt. Evans into the permanent employ of the Fore River company in whose service he has been on various occasions, notably when he had command of the battleships New Jersey and Vermont and the new Curtis turbine steamship Creole built for the Southern Pacific Co., on their trial trips.

The accompanying photograph of Capt. Evans shows him at the stern of the scout cruiser Salem just before her launching at the yards of the Fore River Ship Building Co. on Saturday, July 27, 1907.



CAPT. T. E. EVANS.

Wm. H. Follette, mayor of Tonawanda and owner of the principal line of canal boats plying on the Erie canal, says that boat men are provoked at the dilatory tactics employed in fixing the break in the Erie canal near Syracuse. What has angered the canal men particularly has been the attempt to make permanent repairs instead of fixing the break temporarily and reopening navigation as soon as possible, as has been the invariable rule in the past. Mayor Follette is of opinion that the break which occurred in July should have been repaired in 10 days, whereas it is not repaired yet. The interruption of navigation has disarranged all schedules.

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THREATENED STRIKE OF MARINE ENGINEERS.

The Marine Engineers' Beneficial Association has presented to the steamship and tug boat companies at the port of New York a demand for a new wage scale, to go into effect Oct. 1, the failure of the employers to sign which is threatened to precipitate a strike, affecting every vessel on the Atlantic flying the American flag, including the coastwise lines to the Gulf of Mexico and the various interests operating ocean going tugs.

The engineers demand increases varying from 5 to 10 per cent, the wage to be paid being governed by the class of vessel on which the engineer is at work. A working day of eight hours is also demanded, together with regulations regarding overtime, holidays, Sundays, etc. In addition provision is made for boycotting any company which may discharge an engineer belonging to the association, providing that it can be shown that his membership in the association is the reason for his dismissal. It is anticipated that the steamship companies will present a solid front against granting the demands, but the engineers are optimistic of success, as they believe that their wishes will be acceded to, rather than that shipping should be so thoroughly tied up. Among the lines which would be affected would be the Clyde, Morgan, Mallory, Metropolitan, Old Dominion, Savannah, Fall River, United Fruit, American, Red Star, Ward, Panama and Red D. The fleets of ocean-going tugs which would be affected include Merrit & Chapman, Luckenbach, Moran Towing Co. and the Standard Oil Co.

THIRTY KNOTS FOR NEW LINER.

That the Harland & Wolff Shipbuilding Co., Belfast, are to construct a steamship designed for trans-Atlantic trade which is to attain the speed of 30 knots an hour, has been definitely decided upon and the announcement has been made by the Right Hon. A. M. Carlisle, managing director of that company, in an authorized statement.

"This vessel," said Mr. Carlisle, "is to be a steamship of about 14,000 tons register and about 580 ft. in length. She is to have triple screws, two fixed as they are at present on twin-screw vessels; the third in the rudder cavity as in the ordinary single-screw vessel. The two outside screws are to be driven with quadruple-expansion engines of the Harland & Wolff balanced type, and working up to a pressure of about 220 pounds to the square inch. The central screw will be operated by a turbine engine.

"In a few years' time steam propulsion may be a thing of the past. But as matters rest today there is much scope for further development. With a judicious combination of turbine and compensating engines, the construction of a vessel that can cross the Atlantic at 30 knots an hour is easily practicable.

"At any rate, we mean to demonstrate it with one of the nine new liners which we are to build for the trans-Atlantic service."

These nine ships are to be built for the International Mercantile Marine Co. Two are already laid down in the Belfast yards, and the first of these for the Canadian trade, will be launched next spring. It is on this ship that the new method of propulsion will be tested.

The idea, Mr. Carlisle added, was not exactly new. Lord Pirrie, head of the Harland & Wolff Co., had entertained it for some time. Asked how it developed, Mr. Carlisle said:

"It took shape while Lord Pirrie was on board the Lusitania in the new leviathan Cunarder's trip around Ireland. We were invited, Lord Pirrie and I, to join the party. The whole matter was discussed with Messrs. John Brown & Co.'s representatives, who are now our working partners, so to speak. After all, there is really nothing very extraordinary in the suggestion of a 30-knot turbine liner. Such a boat can be built just as easily as a destroyer of equal speed, but I am inclined to think the latest type of oscillating engine, working in conjunction with the turbine, is a distinct advance on either system worked separately, because more can be taken out of the material at hand."

STELLAR AZIMUTH MACHINE.

Capt. Robert T. Lawless, who, for many years, has been in the employ of the Oceanic Steamship Co., in command of the steamship Mariposa, that plies between San Francisco and Tahiti, will leave the former place very soon for a trip to London. Capt. Lawless has been for years a tireless student of the problems of navigation, and, in recognition of his services to the science, his name has been proposed for membership in the Royal Geographical Society, of England.

The particular service that has brought him this recognition, from abroad, is the stellar azimuth machine that Capt. Lawless has lately invented. This instrument solves spherical triangles mechanically, and with absolute correctness, and makes unnecessary the use in navigation of an azimuth table.

By means of this machine, a course may be set on a pitch dark night, and to navigators particularly, and particularly navigators of war vessels, this is invaluable. The United States is now making extended tests with Capt. Lawless' machine. While in Europe, he expects to interest the British admiralty and the French government in the new instrument.

Capt. Lawless believes that every officer of every passenger liner should understand stellar navigation. The compass, he says, is the most useful of instruments, but the most frivolous and vacillating, and requires constant watching and testing. The compass should be checked up every four hours, and even then it may play tricks on the most experienced navigator, he declares. However, the stars are always true beacons, and the navigator who can steer by star sight, says Capt. Lawless, can be as sure of his course as if he had cross-bearings between two lights.

Capt. Lawless designed the instrument for his own use, and says that he would not go to sea without it, as it makes him independent of the use of the compass.

NEW SALVAGE COMPANY.

The Duluth Marine Salvage Co., Duluth, Minn., is a recent incorporation under the laws of the state of Minnesota, the incorporators being Leo A. Ball, Florence McKay and Thomas A. Gall, all of Duluth. The company purposes to carry on a general wrecking, towing, lightering and salvage business and to do all kinds of contracting and construction work. The capital stock is $100,000.

The O'Donnel & Sandstrom Ship Building Co., Hoquiam, Wash., has recently been awarded a contract by E. S. Estabrook, of San Francisco, Cal., for the construction of a steam schooner for use between San Francisco and the Coquille river, replacing the Fifield which was recently destroyed by the fire in the Price ship yards at Bandon, Ore. The new vessel will be known by the same name and is to be 186 ft. long, 40 ft. beam and 11 ft. depth of hold. The machinery has already been built at San Francisco and will be installed at the yard, making her the first steam schooner to be completely built and equipped on Gray's Harbor.

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THE MARINE REVIEW

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September 19, 1907.

LUSITANIA'S MAIDEN TRIP.

The Cunard express steamer Lusitania on her maiden voyage across the western ocean made the fastest trip that any steamer has ever made on her maiden voyage, and established the world's record between Daunt's Rock and Sandy Hook, land to land; and yet notwithstanding this phenomenal achievement newspapers are filled with articles that the result was disappointing. The result was in no sense disappointing, but on the contrary is the greatest achievement in the history of the steamship. The report arises probably from the fact that the Lusitania's maiden trip does not equal within fifty-seven minutes, the Kaiser Wilhelm's speed record from Cherbourg. It is somewhat confusing to follow records these days when there are so many points of departure. It was easy when Queenstown was the invariable starting place. The knot speed of the Kaiser was a trifle faster than that of the Lusitania, but this record was not obtained on her maiden trip, but after her engines had seen considerable service.

That the Lusitania was not pushed on her maiden trip is proved by the fact that one-quarter of her total supply of coal was remaining when she got to New York. Moreover, her captain was ordered to keep her within the five-day limit and not to reach Sandy Hook until after daylight Friday. There is no doubt whatever that the Lusitania will break all existing records, day's run, knot-speed, land to land and port to port. She will probably do all this before she is a month older.

No ship that has ever visited these shores has been given such a welcome. She had the honor of opening the Ambrose channel to navigation, with a good six feet of water under her keel. Thousands upon thousands were assembled to see her, and her shapeliness was a matter of general comment. Notwithstanding her huge bulk her lines are as graceful as those of a racing yacht and her bow has the flare of the old-time clipper ships that were once the pride of the American merchant marine. Incidentally, it might be remarked that the Lusitania's time between Queenstown and Sandy Hook is four days and sixteen hours faster than the

AN UNPARALLEL OFFER.

A Present from the Marine Review to Its Friends and Patrons.

The MARINE REVIEW has taken over the unsold volumes of Clarence E. Long's Nautical Magazine, and for every new subscriber who sends in $3.00 for a year's subscription to the MARINE REVIEW, during the balance of the present month of September, will get a bound volume of the Nautical Magazine free. This offer also holds good to regular subscribers. Any subscriber who would like to take advantage of this offer may do so by sending in $3. This will carry your subscription ahead a year from the date of expiration. All arrears must, at the same time, be paid.

The Nautical Magazine needs no introduction. It is the only exclusive work on the theory and practice of lake navigation. It is self-explanatory and easily understood. Anything that you do not understand in it will be answered through the columns of the MARINE REVIEW, if you take advantage of this offer. The Nautical Magazine is well bound and an attractive looking book. Its size is 8 by 11 inches, and contains nearly 500 pages. The regular price of the Nautical Magazine is $5.00, so that this offer is truly a gift. These volumes are limited in number so that if you want one, under these conditions, you must act at once. Captains having the welfare of their crew at heart or some member who is ambitious to get ahead, will do a double favor by letting him know about this proposition. It will benefit both the MARINE REVIEW and the recipient. The cash must accompany every order.

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record run of the famous old clipper ship, Dreadnaught. Probably this phenomenal performance of the old sailing ship is brought into gradual prominence by the fact that such a triumph of naval architecture and marine engineering as the Lusitania is could do no more than cut her record in half.

From quarantine her progress up the bay and North river was one grand ovation. Steaming easily past the Battery, the great vessel made a most imposing spectacle, towering over the numerous smaller craft convoying her to her destination. All along the water front the vessels of the various lines lying at their berths or passing up and down the river saluted by dipping their colors and joining in the choral greeting. The roofs of the down-town skyscrapers were thronged with venturesome spectators, and the rows of windows facing the river were lined with eager faces. From the highest point of the Singer building the great Peace Flag floated, as at the celebration of the one hundredth anniversary of steam-driven vessels on the Hudson in July, and a string of signal flags fluttered a welcome. On the vessels tied to the wharfs, on the wharfs, and, in fact, from every point of vantage, the busy citizens viewed the triumphant procession of the leviathan escort. Two hundred thousand is the general estimate of the throng.

Although the Lusitania failed to lower the speed average of 23.58 knots per hour made by the Kaiser Wilhelm II., of the North German Lloyd, on that vessel's record trip, she covered the distance between ports, 2,780 miles, at an average speed of 23.01 knots, which is in itself a record for maiden voyages. When it is taken into consideration that the Lusitania is equipped with the latest type of propelling machinery, that her installation is far and away the largest of that type yet built, and that she is, to some extent, an experiment, it seems a trifle premature to flaunt the records of rival greyhounds. It should not be necessary for the officials of the Cunard line to announce the fact that the liner was not driven to her utmost. The amount of care and nursing required in handling a new set of marine machinery, prevents, to some extent, confident driving of later days.

Of course, the Lusitania had the benefit of considerable trying out, in one form or another, before eventually starting on her maiden trip, but, as both sides of the Atlantic were not deeply interested in her movements then, as during the past week, an occasional easing of speed would have escaped comment, whereas, on her maiden voyage of 2,780 miles on the ocean, the slightest hitch would have meant temporary stoppage or easing down, the consequent loss of time, and the scathing remarks of the critics. It is to be remembered, also, that the chief engineer and his staff had their reputations at stake, and couldn't afford to take any chances.

That the Cunard Company is highly pleased with the performance of the new vessel goes without saying, and the public generally are satisfied that the Lusitania will, in the near future, break all Atlantic records.

FREIGHT SITUATION.

Ore shipments from mines have been delayed by heavy rains and consequently shipments from the head of the lakes have not been normal during the past week. A total of 1,058,498 tons were shipped from Duluth, Superior and Two Harbors, and while this is a sensible gain over shipments of a year ago, it is not as much as was expected. Trouble on the Mesabi range is practically over, though guards are still being maintained at the mines. The routine of business, however, especially in relation to proper ore mixtures, was seriously disturbed by the strike and its effects are still felt. It is not expected that September shipments will equal those of August, though it is expected that the proportion of shipments will be sufficient to bring the total for the season easily to 40,000,000 tons. The usual fall shortage of cars is being experienced and vessels may expect to spend more time in port from now on. Receipts of coal at Lake Erie ports are light and vessels have to maneuver to get fully loaded even to the extent of calling at two ports for them.

Grain is picking up as the yield of the harvest is now being rushed to the elevators. Grain rates are consequently improving and will probably grow higher in the near future.

WRECK NEAR COLCHESTER LIGHT.

The United States Lake Survey steamer General Williams, engaged in sweeping in the west end of Lake Erie, has relocated the wreck of the steamer Grand Traverse, lying 1 1/10 miles north 5/8 west of Colchester lighthouse. The hull lies in 35 ft. of water, and the least depth found on it was 22 ft. at present stage of Lake Erie. The position of this wreck is on the main-traveled steamer track between Detroit river and Pelee passage. During westerly gales, with Lake Erie piled up at Buffalo and low in the west end, the clear depth of water on this wreck may be reduced to 20 ft., and in violent storms to 18 ft. or less with heavy seas rolling. The wreck has been temporarily marked by a white flag with a red center, with the name "U. S. Lake Survey" printed on it.

DULUTH GRAIN SHIPMENTS.

Duluth, Sept. 18.—The fall grain movement begins with this week and already large consignments are coming into Duluth. The rate on wheat to Buffalo has been at 1¾ cents all week but with the demand for tonnage in the ore trade strong as it probably will be all fall this will undoubtedly advance soon. The receipts and shipments at this port for the past week are as follows:

	Receipts.	Shipments.
Wheat	578,291	571,767
Corn	.....	.....
Oats	28,092	23,807
Rye	11,790	34,309
Barley	244,788	136,540
Flax	74,791	107,399

FALLS HOLLOW STAYBOLT CO.

The greater portion of the building of the rolling mill of the Falls Hollow Staybolt Co., Cuyahoga Falls, was destroyed by fire on Sept. 13, but the principal machinery was not damaged and the company announces that it will be able to execute orders with the usual diligence within a few days.

The steamer City of Glasgow sprung a leak while loading at the Great Northern ore docks at Superior on Monday, and the water poured in so fast that it was found necessary to beach the steamer in order to prevent her from sinking. A steam pump which was installed upon the vessel was unable to lower the water and an additional pump is to be placed on her. She is reported to be in bad shape.

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LAUNCHING THE J. J. SULLIVAN

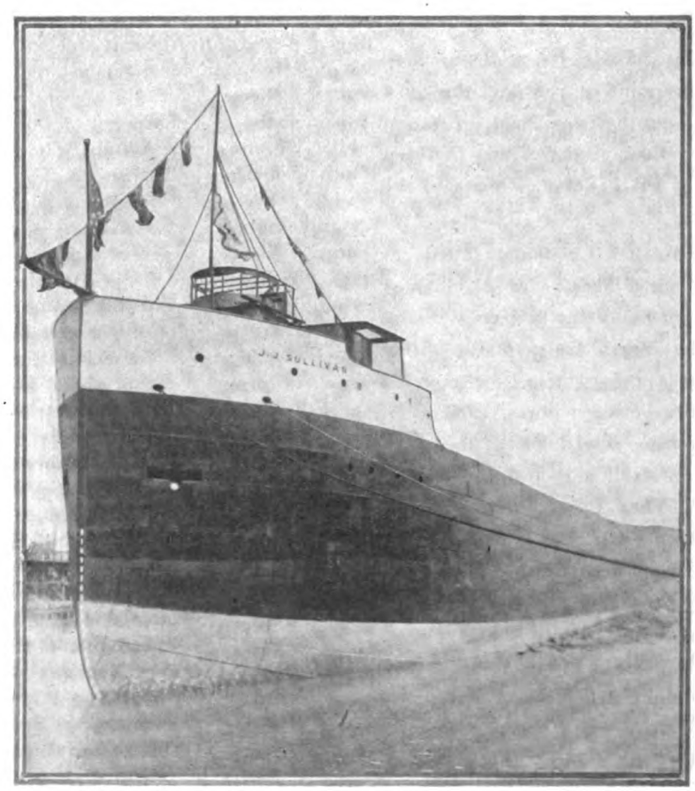
COL. J. J. SULLIVAN, MISS SELMA SULLIVAN AND MR. R. C. WETMORE ON THE LAUNCHING STAND.

The launching of the bulk freighter J. J. Sullivan at the Cleveland yard of the American Ship Building Co. on last Saturday morning was an affair of more than usual importance and was in fact treated as a gala event by many thousands of citizens. The well-kept lawns of the Edgewater park approach were crowded with ladies and gentlemen, as affording a distant but nevertheless decided point of vantage from which to witness the launching. The day was an ideal one for a launching, both from the picturesque and practical standpoint. In the first place the ladies were permitted to wear their finest costumes and in the second place the ways were so slippery, owing to the heat, that the launching party, being all assembled on the stand, prudence dictated that the ship should go overboard five minutes ahead of time.

The vessel was christened by Miss Selma Sullivan, in honor of her father, with such a vim that one of the particles of glass from the champagne bottle cut her finger—a circumstance which is a great mystery to the shipyard officials, as the bottle is invariably thoroughly encased in a complete cage of silver wire.

Mr. Russel C. Wetmore, vice-president of the American Ship Building Co., did the honors at the luncheon given at the Hollenden later. In proposing a toast to Miss Sullivan he said that many young ladies had performed heroic service in assisting in launchings, but that Miss Sullivan was the only one who had ever shed her blood to bring a launching to a successful issue.

Mr. Harvey D. Goulder acted as toastmaster and was unusually felicitous. He referred to the tremendous industry into which the Sullivan had been plunged, saying that the commerce of St. Mary's canal during the eight months of the present year in which it will be possible to move freight through it, would be 60,000,000 tons, whereas ten years hence, when the Panama canal is finished, the commerce of that waterway, according to the figures of the most noted experts, will not be one-sixth that total. He related that a few years ago he made a chart showing the commerce of the great lakes in cycles of ten years, based upon the actual figures, and had projected the curve in the same proportion to 1925. He has already found that the commerce of 1907 equals that which he credited to 1909 and therefore predicted that the tonnage of 1925 would be 200,000,000 tons. The ton-mile movement on the lakes today is one-third the performance of all the railroads in the United States, while the average rate of moving freight on the lakes is 0.85 of a mill, as against 5 mills for the railroads. Into this vortex of business the J. J. Sullivan has been plunged and he did



THE BULK FREIGHTER J. J. SULLIVAN IMMEDIATELY AFTER LAUNCHING.

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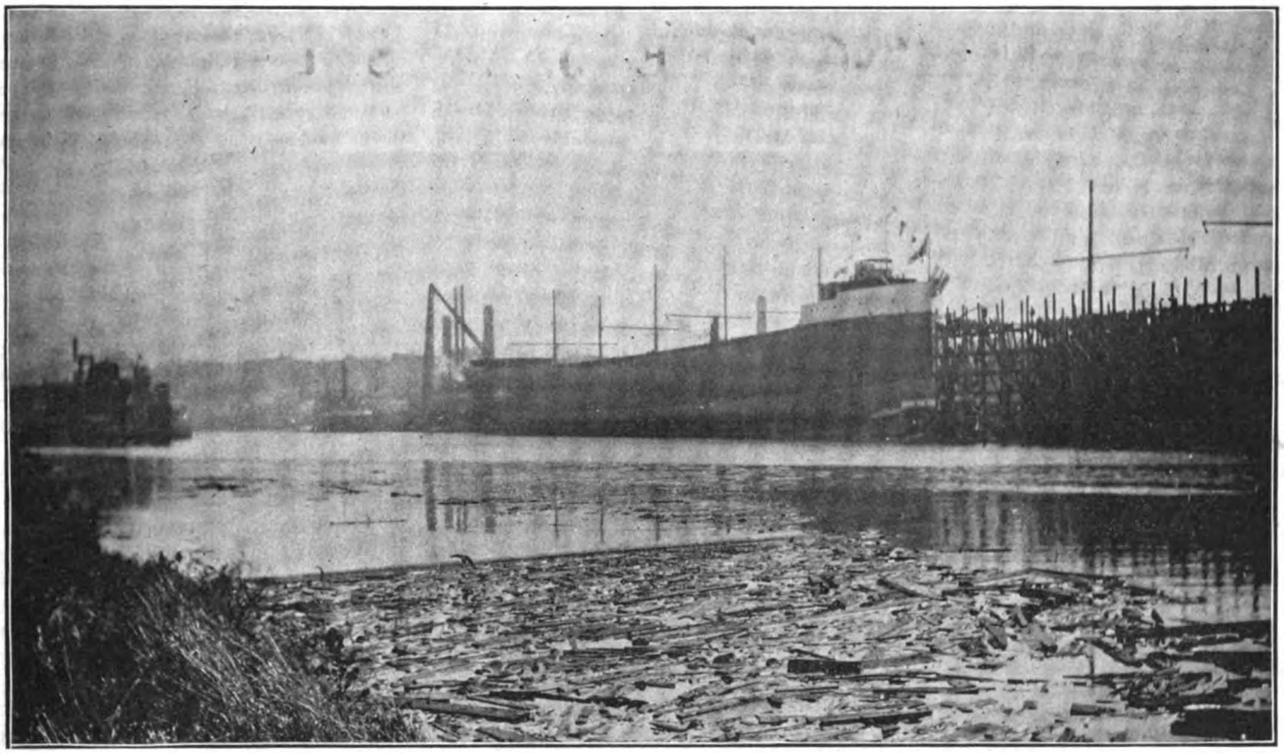

THE BULK FREIGHTER J. J. SULLIVAN ON THE STOCKS JUST PRIOR TO HER LAUNCHING.

not doubt that the ship would take her share in it as her namesake had in the practical affairs of life. He then, in introducing Col. Sullivan, likened his activity to a great human compass, directing the energies of many men.

There was great applause when Col. Sullivan arose.

"The glowing words of praise so generously indulged in by our genial and versatile toastmaster," said the colonel, "might be considered to be embarrassing, but yet while I am aware they are gross exaggerations, I am not displeased. In this connection I am reminded of the visit of the bishop of Kentucky to London with his colored coachman. One day the old coachman drove the bishop to a great reception in London. At its conclusion the servant in charge of the carriage arrangement called out "The carriage of the Lord Bishop of London." A carriage drove up and the London bishop got in and drove away. Then came the call: "The carriage of the Lord Bishop of Oxford." A carriage drove up and the Lord Bishop of Oxford drove away. Then came a call: "The carriage of the Lord Bishop of Kentucky." No carriage drove up. After a brief period the call again went up: "The carriage of the Lord Bishop of Kentucky." There was no response. Then a third and more imperious cry went up in stentorian tones. "The carriage of the Lord Bishop of Kentucky." The old coachman then drove up. When the bishop of Kentucky had reached the hotel he turned to his old coachman and said: 'Rastus, you rascal, why didn't you drive up when they called my carriage?' 'Well, massah, I was so tickled to hear them call you the Lord Bishop of Kentucky that I thought I'd just hear it as often as I could.'" From which the colonel deduced the reflection that the average man is pleased with attention.

The colonel acknowledged his deep sensibility of the honor of having so magnificent a steamer named after him. Dr. Johnson, he said, likened a ship to a prison with the added advantage of the possibility of being drowned and that Shakespeare had likened it to a cradle to be rocked by the rude and imperious surf, but modern men with their advanced civilization and their grasp upon the material things of the world know the ship to be a component part of civilized life, an excellent earning power and a floating palace as well. He then announced that the Sullivan had passenger quarters too and on behalf of the managing owner invited all present to take a ride on her.

Capt. Chas. L. Hutchinson followed in a brief but excellent talk in which he dwelt upon the point that the Sullivan could carry in a single trip ten times the cargo of the ship in which he sailed 20 years ago—the Rube Richards.

Brief speeches were made by W. H. Canniff, C. O. Jenkins, M. A. Havens, George W. Kinney, F. A. Case, W. R. Warner, John Stockwell, F. A. Scott, H. H. McKeehan and Capt. W. P. Benham, all doing honor to the colonel.

It is expected that the Sullivan will go into commission in about 30 days. She will be sailed by Capt. W. P. Benham and her chief engineer will be R. J. Smith.

The Sullivan is 552 ft. over all, 532 ft. keel, 56 ft. beam and 31 ft. deep. Her engines are triple-expansion with cylinders 23½, 38 and 63 in. diameters by 42-in. stroke, supplied with steam from two Scotch boilers, 14½ ft. diameter and 11½ ft. long, allowed 180 lbs. pressure and fitted with Ellis & Eaves draft. She will carry 11,000 tons on favorable draft.

Those present at the launching were: Col. and Mrs. J. J. Sullivan, Miss Selma Sullivan, Mr. and Mrs. Harold Seymour, Corliss E. Sullivan, Capt. and Mrs. Chas. L. Hutchinson, John Hutchinson, E. K. Hutchinson, W. H. McGean, W. C. Mulcahy, Martin Mulhern, Rev. J. C. O'Reilly, W. H. Becker, John M. Mulrooney, R. C. Wetmore, Robert Logan, Capt. and Mrs. W. P. Benham, Miss Jennie Benham, Mildred Benham, Mr. and Mrs.

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W. H. Caniff, Mr. and Mrs. George W. Kinney, Harvey D. Goulder, Mr. and Mrs. F. A. Scott, Miss Katherine Scott, Mr. and Mrs. C. A. Paine, W. R. Warner, A. C. Dustin, H. H. McKeehan, L. H. Kittredge, Samuel Scovill, Miss Helen Fayrweather, H. N. Herriman, H. Steinbrenner, Capt. Edward Morton, John W. Taylor, Mr. and Mrs. H. H. Ward, E. B. Lilley, F. W. Hart, J. H. Mellin, Mr. and Mrs. John Stockwell, Samuel T. Nash, Wm. Nash, W. B. Davock, F. S. Masten, Mrs. R. A. Snavely, Miss Nellie Snavely, Capt. J. W. Brion, Harry Donaldson, Capt. and Mrs. F. A. Tick, Mr. and Mrs. R. Parry Jones, Mrs. F. C. Phillips, Miss Hayes, J. T. Kelley, George Randerson, A. Thompson, D. T. Croxton, Mr. and Mrs. A. A. Augustus, Miss Mabel Eddy, John A. Penton, Miss Catherine Stone, Dr. J. H. McHenry, Dr. and Mrs. Carlysle Pope, Mr. and Mrs. Frank R. Gilchrist, Mr. and Mrs. J. W. Warwick, C. O. Jenkins, Mr. and Mrs. Henry A. Taylor, L. J. Cameron, W. H. Teare, Munson A. Havens, G. J. Darling, Guy S. Gardner, Miss Ruth Stone, Miss Jennette Kinney, Walter C. Hill, Mr. and Mrs. Lee Selover, of Cleveland; Mr. and Mrs. L. A. Loichat, Johnson Sherrick, and F. E. Case, of Canton; Mr. and Mrs. Henry Wineman, of Detroit; and Miss Margaret Quilliard, of Duluth.

ATLANTIC COAST GOSSIP

Office of the MARINE REVIEW,
1005 West Street Bldg.,
New York City.

Although the officials of the Cunard line had made extraordinary preparations for the admission of the sightseeing public to the Lusitania, they were hardly prepared for the small army which besieged the offices of the company the first few days of the ship's stay in port. It is estimated that over 5,000 persons applied for the necessary permits on Monday.

It was intended originally to open the ship to the public for one day only, the number of visitors being limited to 2,000. In the face of the enthusiasm of the populace, however, and the unexpected rush on the sightseeing department, the vessel has been open for inspection Wednesday and Thursday.

It has been pointed out by several individuals who "go down to the sea in ships" that the horn on the mammoth liner is all out of proportion to her tremendous bulk. Its periodical blast in the midst of the general chorus on her passage up the river did sound rather startling.

To add to the general excitement in the shipping world, La Provence, the fastest ship of the French line, crossed the bar at 6:20 Saturday morning, making a new record between New York and Havre of six days, one hour and twelve minutes. Her average speed on the voyage was 22.8 knots, her best day's steaming being 585 knots. The best day's run of the Lusitania was 593 knots.

Concerning the marine engineers' demands, the belief seems to prevail that, as neither the companies nor the marine engineers are desirous of seeing the resignations of the engineers handed in, there may be concessions on both sides. It is understood that the managers of the steamship companies on which the demands for higher wages have been made by the engineers will meet some time this week to consider the situation.

Barber & Co. announce the establishment of a new line of steamers to the west coast of South America, which will make Valparaiso, Iquique, Callao, and other large ports along the coast their destination. The line will be opened with a six weeks' service, and the operation of a fleet of six vessels. This new service is in addition to the other lines now operated to South American ports by Barber & Co., and is established because of the company's belief that the growing business warrants such an extension.

The American is a man of broad interests. There are men inland who never saw the ocean who could hardly sit still until they heard if the Lusitania had broken the record.—*Washington Times.*

News has been received at Ellsworth, Me., of the loss of the Italian bark Emilia L., which was bound from Aberdeen, Scotland, for Stockton, Me. The bark went ashore last Saturday in a dense fog on Black Ledge, near Stonington, and it is expected that she will be a total loss. The vessel was light, having discharged her load of salt elsewhere, and it was the purpose to load at Stockton. The crew reached the shore safely. The Emilia L. registered 385 tons and was valued at $30,000.

Messrs. Buck & Jevons, agents for the Lamport & Holt line, and the Prince line, are announcing the introduction of a fleet of new and powerful steamers on their lines. The Lamport & Holt line is putting on the Voltaire, Velasquez and Veronese, steamers of over 11,000 tons, and the largest steamers in the South American trade. The Prince line are announcing their new steamers Norse Prince and Royal Prince. These steamers have been but recently launched and will make their maiden trips from New York in November and December. They are first class in every way, and of about 10,000 tons.

In the great world contest for the blue ribbon of the Atlantic ocean, the American ship builders are idle spectators. They prefer the more profitable building of ships for the coast trade, in which they have no competition, as long as congress cannot be persuaded to give them a big subsidy.—*Philadelphia Record.*

News items follow fast. With the arrival of the Lusitania and the record-breaking La Provence on Friday came word that Harland & Wolff are at work upon the plans of a White Star line steamer that is to be larger than the Lusitania. The keel of this vessel is to be laid in a few months, and she will be fitted with reciprocating engines and turbines. It is rumored from another source that the new vessel is to be of 40,000 tons register.

The Cunard line steamship Mauretania, sister ship of the Lusitania, left her builders' yard at Wallsend for her first speed trial off Newcastle-on-Tyne on Monday. She will return to the yard for her final fitting out and furnishing.

Supervising Inspector General Uhler, of the Steamboat Inspection Service, has sent telegrams to all local inspectors asking for the names of all owners of motor boats of more than 15 tons in their districts. Mr. Uhler also requested information showing whether the owners were properly licensed and whether the motor boats carried the required number of life preservers and lights.

The G. H. Schofield Co., government contractors, with headquarters in New York, on Monday pleaded guilty before Judge Holland in the United States district court at Philadelphia to the government's charges of violating the eight-hour labor law. Judge Holland in passing sentence said that as it was not shown that the Schofield company intentionally broke the law, he would impose a maximum fine for one offense, although the indictment consisted of 149 counts. He then sentenced the defendant company to pay a fine of $1,000 and the costs of prosecution. The charges were brought in connection with the building of the dry dock at the League Island navy yard.

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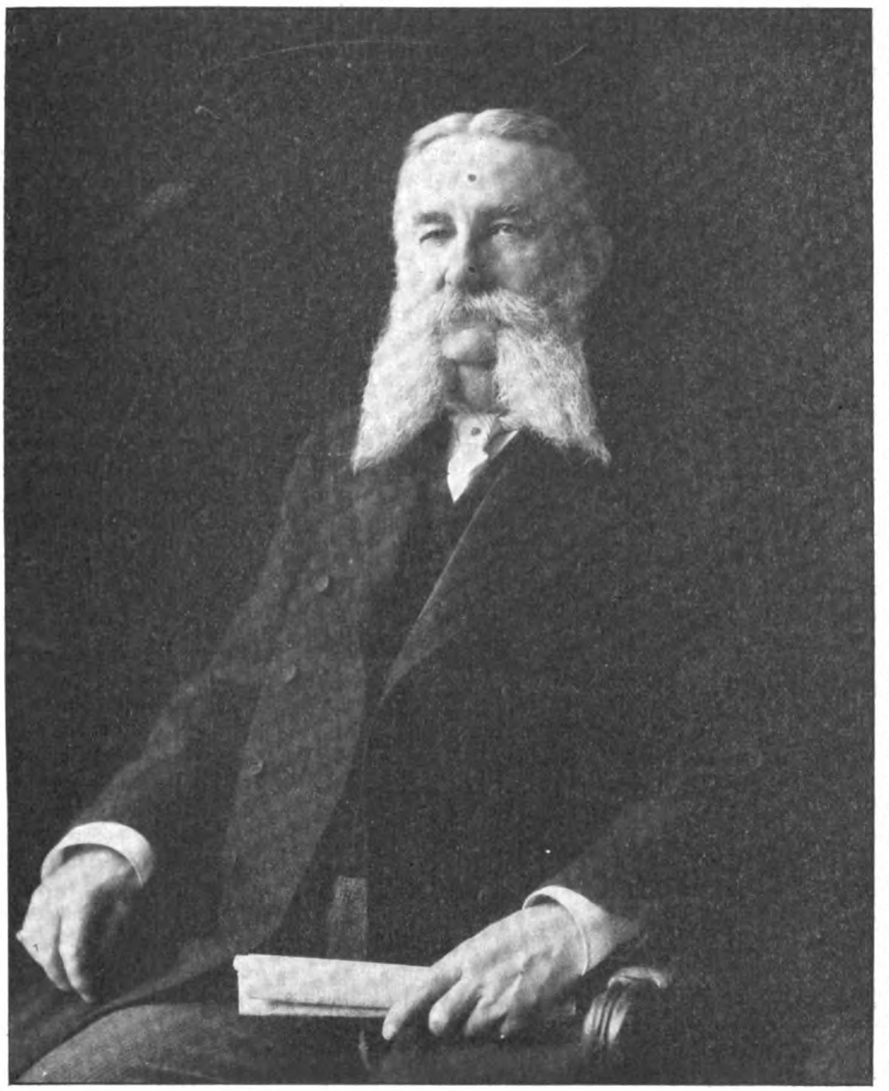
DEATH OF REAR ADMIRAL WALKER.

Rear Admiral John Grimes Walker died suddenly at York Beach, Me., on Sept. 16. He was one of the best naval experts in the United States. His latest public service was as chairman of the Isthmian Canal Commission appointed by the late President McKinley. He was born in New Hampshire March 20, 1835, and was appointed to the Naval Academy from Iowa in 1850. In 1856 he graduated at the head of his class.



REAR ADMIRAL JOHN GRIMES WALKER.

After his graduation he spent the following year at the Brazil station. While in these waters he was promoted to a lieutenant and transferred to the frigate St. Lawrence. He remained on the St. Lawrence until 1859, when he was appointed to the Naval Academy as instructor in mathematics.

At the outbreak of the civil war Walker was serving in the capacity of a lieutenant on the steamer Susquehanna along the Atlantic coast. He did his first fighting on board the gunboat Winona, taking part in the passage of Forts Jackson and St. Philip and in the operations around Vicksburg.

For bravery in these operations he was commissioned lieutenant commander in 1862, and shortly after received his first command on the ironclad steamer Baron de Kalb. This craft was attached to the Mississippi squadron, and went through some heavy fighting at the second siege of Vicksburg, where Walker again distinguished himself.

At the close of the war Admiral Walker was sent to the Brazil squadron, where he was in command of the steamer Shawmut. While in the tropics he was promoted to commander, and shortly afterward was called home and again returned to the Naval Academy, where he remained until 1869. He was made lighthouse inspector in 1871, and two years later was elected secretary of that board. In 1881 he was placed at the head of the Bureau of Navigation, in which position he served for eight years.

Walker was appointed rear admiral in 1889, and the squadron of evolution, which had just been organized, was placed under his command. He took that fleet on its famous European cruise.

During the revolution in Honolulu, Walker was sent by President Cleveland to gather a report. His report made a sensation. It charged that the British influence was being used to keep Queen Liliuokalani on her throne. Although this statement was upheld by several members of the senate, it was opposed to the president's policies.

Reaching the limit of 62 years Rear Admiral Walker was placed on the retired list in 1897. This, however, did not bar him from again entering into an expedition for his country, for when the question of the Panama Canal came up under McKinley's administration he was appointed chairman of that commission.

WATERWAYS COMMISSION.

The members of the rivers and harbors committee of the house of representatives are at present making a trip up the lakes, having left Buffalo on the steamer Juniata on Sept. 16. They arrived at Cleveland on the afternoon of the 17th and were met at the dock by the harbor improvement committee of the Chamber of Commerce. Hon. T. E. Burton, chairman of the committee on rivers and harbors, met the members to welcome them, but owing to another engagement was unable to spend any time with them during their brief stay in the city, which lasted only until 11 o'clock, when the Juniata left. The members of the committee were accompanied by their wives and were taken to the Euclid Club for dinner. The congressional party consists of E. S. Acheson of Pennsylvania and Mrs. Acheson; D. S. Alexander of New York; George F. Burgess of Texas; J. H. Davidson of Wisconsin and Mrs. Davidson; Edgar C. Ellis of Missouri and Mrs. Ellis; James A. Moon of Tennessee

(Continued on page 32.)

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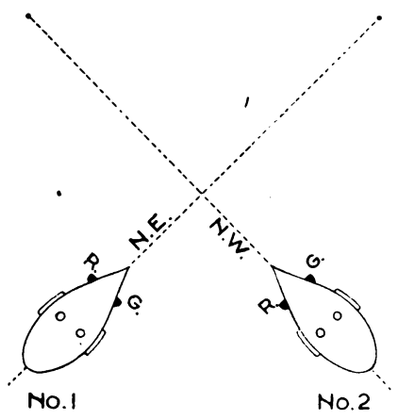
QUESTIONS FOR WHEELSMEN AND WATCHMEN.

SIXTEENTH INSTALLMENT.

This course of instruction by the question and answer method was commenced in the May 23 issue of the MARINE REVIEW. It is for the purpose of promoting the young man aboard ship. It tells him the steps necessary in the examination for first papers, and it deals with only those problems that are absolutely necessary for him to know. This feature of the paper has met with a great deal of encouragement. New subscribers will be furnished with the questions and answers from the start, so that it will prove as available to the new reader as the old. Even licensed men have taken a lively interest in this department, and are watching it with interest.



TWO STEAMERS UNDER WAY.

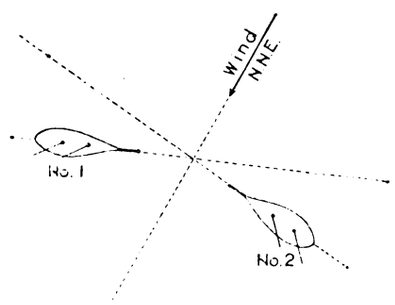
179. According to the above illustration, which steamer has the right of way, No. 1 or No. 2?

180. What is the duty of each according to the Rules of the Road?

181. Supposing that No. 1 blew one blast of her steam whistle and No. 2 answered with two blasts, what would each one do?

182. If No. 2 should starboard her helm, would she pass ahead or astern of No. 1?

183. If No. 1 should starboard her helm, would she pass ahead or astern of No. 2?



TWO SAILING VESSELS UNDER WAY.

184. Which tack is No. 1 on?

185. About how is No. 1 heading?

186. What tack is No. 2 on?

187. About how is she heading?

188. Have they the wind forward or abaft their beams?

189. Which one has the right of way?

190. How will No. 2 head on the port tack with the wind the same as in the diagram?

ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

THIRTEENTH INSTALLMENT.—PUBLISHED AUG. 22.

143. A screeching whistle (something on the order of the siren). Its signal indicates that a steamer has a raft in tow.

144. An automatic fog horn.

145. Air compression.

146. 150 feet and less in register length.

147. More than 150 feet register length.

148. A light showing all round the horizon and displayed when a vessel is lying at anchor, tied up to a wharf, aground in a channel or near a channel, etc.

149. An anchor light shows 32 points of the horizon and a foremast light shows but 20 points.

150. No difference.

151. By giving five or more short and rapid blasts on the steam whistle.

152. Any unusual number of blasts of the whistle; usually four long ones and four short ones continued at regular intervals. Showing a red light over a green light, or vice versa. Also by passing the two colored lights in front of each other. Any unusual or out of the ordinary display of lights. In the day time display the American flag at half mast.

153. From SW to ESE by way of south.

154. From ESE to NNW by way of south and west.

QUESTIONS FOR MASTERS AND MATES.—NO. 42.

581. In cloudy weather how would you get a course from Detour to Middle Island?

582. Why is it that no two compasses on board show ship's head to be the same?

583. If the pilothouse compass says that the ship is heading S x E ½ E and the bridge compass shows at the same time that the ship is heading S x E, and you find that the ship's head is S ¾ E correct magnetic, how much and which way is the deviation in each case?

584. What is the proper way of making port in thick weather after getting hold of the fog whistle?

585. Your true course is WNW, mean Var. 6° Wly. Dev. 5° Wly. what compass course would you steer?

586. Supposing after you got started you find that you are making ½-pt. leeway, the wind being N x E, what course would you then steer to counteract these effects?

587. Why does the direction of the wind appear different to a person standing on the deck of a moving vessel than it really is?

588. How could you determine the true direction of the wind under such circumstances?

589. If you were on the deck of a fast moving steamer would the wind appear to you as it would to one on board of a slow moving sailing ship?

590. Is the true direction of the wind farther from the bow than the apparent direction?

QUESTIONS AND ANSWERS DEPARTMENT.

This department is for the purpose of giving a wider scope to all questions relating to the theory and practice of lake navigation and kindred subjects. If there is any question you would like answered or a more detailed explanation of any subject printed, you may have it done through this column. Every reader interested in the study of navigation is invited to make use of this department.

THE STATUTE KNOT.

Question:—What is a statute knot?

Answer:—1 statute knot=1/60 of a degree of longitude on the equator. Its length in feet is 6,082.66. The statute knot is similar to the geographical mile, each depending on the same rule for its length. Their measure, however, is only of account on the equator, where they conform to nature's conditions. Although the nautical mile (and knot) and geographical mile get their measurements from a scale of nature, the basis for computation, however, depends on the arbitrary measure given the statute mile, which is 5,280 feet. The statute mile is so-called because it originated by an act of law or according to statute. It was incidentally defined to be "8 furlongs (600 ft.=1 furlong) 320 rods (16½ ft. = 1 rod), or 1,760 yards = 5,280 ft."

Mile is from the Latin millia, plural of mille, meaning a thousand, i. e., millia passum, a thousand paces. This 1,000 paces in this country and England equivalent to 320 poles or rods, or 5,280 ft. The distance called a mile varies greatly in different countries, hence each country has its own particular kind of land mile. It is interesting to note that the length of the mile originated from pace or the measured step. The Romans figured a thousand paces to the mile, equal to 1,614 yards English measure.

In order to determine the length of the geographical mile, the nautical mile, the knot, etc., it became first

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necessary to adopt a standard of measurement by arbitration. Since the earth is not a perfect sphere the various miles mentioned conform to the irregularities of mother earth, as figured from the one basis, that is, the statute mile and the degree of latitude and longitude; hence, they are said to be based on a scale of nature. In other words, our turnip-shaped planet is made a perfect sphere in so far as its division into degrees of the circle are concerned, but they do not agree as to length.

Since the equatorial circumference of the earth is greater than its polar circumference, the length of a degree both of latitude and longitude varies over the earth's surface, hence, the length of one cannot agree for both. Then length of a degree of longitude is greatest on the equator, and diminishes toward the poles, and at the poles has no value whatever. At the poles the degree of latitude is greatest and least at the equator. The earth being bulged at the equator and flattened at the poles causes the spaces between the parallels of latitude to vary, becoming greater as the poles are approached. As to its division in degrees and fractions of a degree, the earth is presumed to be a perfect circle, but in order to make it conform to the table of circular measure, these irregularities must be reckoned with when we come to traverse the earth's surface. And this is why we have so many different kinds of miles to deal with. The equatorial circumference of the earth has actually been measured. It was, of course, measured in statute miles, and the whole turned into feet and this divided by 21,600, the number of minutes of arc in a circle, or thus: 1/60 of 1/360, or 1/21,600 of the circumference of the earth. This is what is termed the geographical mile or statute knot.

Again, since the spaces between the degrees representing the parallels of latitude vary, both on account of the flattening and bulging of the earth's shape, the degrees of latitude are not everywhere the same in length, and neither do they conform to the length of the degree of longitude on the equator. When we say that every minute of latitude is equal to a nautical mile, we are not telling the actual truth. A minute of latitude next to the equator is 6,046 ft. increasing to 6,109 at the poles. This would give the mean nautical mile a length of 6,077.5 ft. This would naturally seem the correct length to give the nautical mile, but its length of 6,080 ft. was adopted to correspond to the latitude of the region most traversed by the fleets of commerce. Six thousand and eighty feet correspond to latitude 48°, and these figures — recommending themselves more particularly on account of round numbers, have been adopted. Hence, it will be seen that the differences between the geographical mile, the mean nautical mile and the nautical mile of 6,080 ft. are not appalling; it is well to know what each one is and how determined.

The nautical mile, sea mile and knot are each based on the measure of 6,080 ft. The nautical mile or sea mile relates to both distance and speed, while knot relates to speed only.

THE THEORY AND PRACTICE OF LAKE NAVIGATION

BY CLARENCE E. LONG

POSITION FINDING CONTINUED.

This special department is conducted for the advancement and betterment of the lake mariner in his various stations aboard ship. Lake and coast navigation being similar, this course of instructions is applicable to both, and the foundation for deep-water navigation; hence, every sailor, no matter whether he be a fresh or a salt water man, should be interested in this department. A careful study of this department will give you many hints to help along your practice. The policy of this department is to make its instructions as thoroughly practicable as possible.

THE 2 AND THE 4-POINT BEARING—A HANDY METHOD.

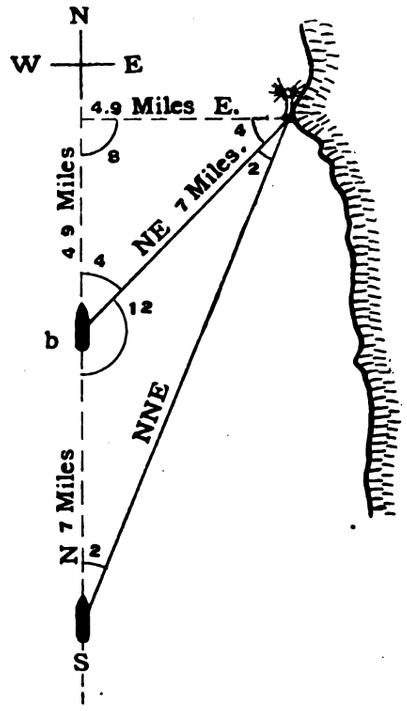

FIG. 4.

THE COMBINATION BEARING.

The ship is steering North. At S the light bears NNE. At B, 7 miles from S, the same light bears NE, 2 points from first bearing, or 4 points from course. As the angle at S has been doubled at B the distance run in order to change the bearing the same amount between course and first bearing as between first and second bearing, (the distance) S B is equal to the distance from B to light. The ship at S is at first bearing and at B at second bearing, and as the ship traversed 7 miles to reach B from S she must be the same distance from the light as she has run, since equal angles give equal sides.

The dotted or upper portion of diagram, is the distance determined by multiplying one of the equal sides of the 2-point bearing by the decimal 7; thus 7 miles × 0.7 = 4.9 miles, or practically 5 miles. By continuing to steer north from B the ship will be this distance from the light when she has it abeam. By the 0.7 method the navigator can tell the distance he will be off when abeam when he reaches B.

TO PROVE IT.

The last half of a 2-point bearing is the first half of a 4-point bearing. If you were to take a 2-point bearing to find the distance when abeam, and you found it to be correct, that is, you wouldn't have to alter your course any at second bearing, the distance run to get it abeam should be the same as the distance you figured out ahead of time.

THE FACTOR 0.7.

You will probably want to know why it is that the distance on the 2-point bearing multiplied by 0.7 gives the distance on the equal sides of the 4-point bearing. It is merely a question of the proportion of the sides of a triangle. If a book of traverse tables is at hand open the tables at 45°, and against 1 in the distance column (the hypotenuse of the 4-point bearing) you will find it. By taking 10 as a distance and shifting the decimal point to the left the factor becomes 0.71 (see table further on); and by taking 100 in the distance column and shifting the decimal it becomes 0.707. Hence to find the distance on the hypotenuse (the longest side of the 4-point bearing) if the distance is less than 10 (you will know this from the length of the two equal sides) multiply the distance run (to change the bearing 4 points) by 0.7 and then double the product, the sum will be the distance on the hypotenuse.

USE THE DECIMAL 0.7.

In the beam and quarter bearing, where it becomes necessary to find the distance (on the hypotenuse) that the ship is from the object at second bearing, instead of finding it by the application of square root, one of the

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above factors may be used in its stead.

THE COMBINATION BEARING.

The combination of the 2-point and 4-point bearing is without doubt the best of the bearing methods, and its great advantage is that it can be solved mentally. What master is there but what has had the experience of being required to leave the bridge in a rain or snow storm to wrestle with the chart and parallel rulers and dividers, in plotting the position of the vessel, because he was not acquainted with methods which do not necessitate such proceedings.

WHERE THE BEARING IS DEFECTIVE.

Although the 4-point bearing method alone is defective in one respect, namely, that the navigator sometimes requires to know the distance he is going to pass off the object before it comes abeam, without going to the trouble of finding his position on the chart and laying off the course that will take him the required distance; by using the 2-point method in conjunction with it it serves the purpose admirably.

THE "DODGES" BEARINGS.

The 2, 3, 5, etc., point bearings and fractional points thereof are sometimes called the "Dodges" by the navigator. The following are a few examples for practice:

You are steering W½S, logging 14 miles an hour. At 9:22 Seul Choix Pt. lighthouse bears WNW and at 9:30 the same lighthouse bears NW½N. How far and in which direction are you from the lighthouse? What kind of a bearing is this?

HOW IT IS WORKED.

This is a 2½ point bearing, because this is the number of points between the course and first bearing; also by doubling the difference between course and first bearing produces the second bearing. The ship is 2.8 miles SE½S from the lighthouse; found thus, the time between bearings is 12 minutes, that is, it took 12 minutes to double the difference in points between course and first bearing; we then have this proportion: As 60 minutes, the number of minutes in one hour, is to 12 minutes, the length of time that the vessel has run between bearings at the rate of 14 miles an hour, so is 14 miles to x miles, the unknown quantity to be found, or thus:

60 mins. :12 mins. :: 14 miles : x miles

14

—

48

12

——

60)168.0(2.8

120

——

480

480

——

x equals 2.8 miles, the distance run between bearings, consequently, it equals the distance the ship is from the light.

TO TELL OF THE KIND OF BEARING.

Note.—The first thing to be done by the student in working these bearing examples is to see what the difference is between course and first bearing; also the difference between first and second bearing. This will tell you at once what kind of a bearing you have to deal with. If there is the same difference between course and first bearing as there is difference between first and second bearing, you know that two of the angles are equal, and that opposite these angles will be found equal sides.

Ex.—You are steering N by E¼E at the rate of 11½ miles per hour. At 4:12 Cana Island lighthouse bears N½W and at 4:28 the same lighthouse bears NNW¾W. How far and in which direction are you from the lighthouse?

This is a 2¼-point bearing. The vessel is three miles SSE¾E of Cana Island lighthouse; found thus, 60m. : 16m. :: 11.5 mls. : x mls. and x equals three miles.

A GOOD PRACTICE.

Note.—One of the best practices for the student is to plot these bearings on the chart just as they are given here, and over the various lighthouse and points mentioned. This will give him a better idea of their solutions, and will not only prove his work, but will help him to form the right conception of the manner in which it is and should be done. Always lay off the bearing lines first, and the distance run prick off with the dividers from the chart scale. A good practice is to take the distance off at second bearing between the dividers, and with one leg of the instrument on the object, let the other come on the line drawn to represent the second bearing, mark its place, or keep the point of the dividers there and move the other leg from its position over the object, to where it will exactly meet the line drawn to represent the first bearing. The position of the dividers now represents the course as steered, for on drawing a line connecting these points, and then transferring this line by means of the parallel ruler to the nearest diagram compass will verify it. If you are careful in drawing the lines and measuring the distances, your work will stand correct. These same bearing lines can be laid down by means of the protractor on a sheet of paper to any desired scale. If a large scale is desired this is probably the better way of doing it, although the chart can be used for the same purpose, using a larger scale than the miles on the chart.

No matter how much practice he has had, the student can never become too proficient in this bearing work.

ANOTHER HANDY BEARING.

It oftentimes occurs in thick weather that it clears up about the time you are abreast of a place and you want to know how far you are off the land. You have gone too far to get a Dodge or 4-point bearing; here is a good method for this purpose: Note the time carefully when it bears exactly 26½° (2⅜ points) before the beam, and again when it has the same bearing abaft the beam. The distance run between bearings is the distance of the object when it was abeam.

These bearings forming close upon an equilateral triangle (a triangle whose angles are 60°, consequently each side is equal) give a specially favorable result.

Ex.—At 4 o'clock Harbor Beach light bore 26½° before the beam; at 4:19 it was abeam, and at 4:38 it bore 26½° abaft the beam. Ship steaming 13 miles an hour against a head wind that stops her progress two miles an hour. Required the distance from the light at 4:19 when it was abeam.

The ship ran 38 minutes between bearings so we get this statement: 60m. : 38m. :: 13 miles : x miles, and x equals 8.2 miles, disregarding the effects of the wind. For the wind we get this proportion: 60m. : 38m. :: 2 miles : x miles, and x equals 1.2 miles, which deducted from 8.2 miles leaves 7 miles, the distance that the ship was from the light when she had it abeam, or at 4:19.

TO PROVE IT ON THE CHART.

To prove this on the chart (if you have no chart of Lake Huron, take any chart and assume a position) take a distance of seven miles between the points of the dividers and measure off abreast of the light or place, as near as you can see by the eye alone, and with the parallel rulers trace the line; draw a line exactly at right angles to this that will pass through or touch the outer extremity of the first line drawn; this represents the course that the vessel is steering. Next lay off with the parallel ruler, or protractor, an angle of 63½° (90°—26½°) from this line representing the course (to come forward of abeam) transfer this angle to the object to the line repre-

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senting the course; this will represent a bearing of 26½° forward of the beam. Next get an angle of 63½° from this course (to come abaft of abeam) and transfer it to the object and draw a line to the course. It will be seen by measuring that the distance between these two bearing lines (the course) is equal to the line drawn from abreast the object to the course, or the point which represents the vessel when she was abreast the object. It will also be noted that the two bearing lines are of equal length, which is due to the angles opposite them being equal.

To draw a diagram that merely represents this triangle, ignoring course and distance, draw two lines of equal length from the object at an angle of 53°; connect the ends of these bearing lines to represent the course and you have it. Why do we use 53°? Because this represents the angle subtended by the side representing the course. The two bearing lines from the course to the object are each 63½°; hence, 63½° + 63½° + 53° = 180°, the sum of the angles of every triangle, whether right-angled, isosceles, scalene, etc. A line drawn to the object from the center of the side representing the course will be found the same length as that of the course, which is the principle of the bearing. This 26½° bearing forms an isosceles triangle, because two of its sides are equal. See Fig. 6.

HANDY FACTORS FOR BEARINGS.

Should a bearing before or abaft the beam be observed at any angle on the bow or quarter, the distance when abeam can readily be obtained by multiplying the distance run in the interval by a factor taken from the subjoined table:

30°.57	39°.81	48°1.11	57°1.54	66°2.25
31°.60	40°.84	49°1.15	58°1.60	67°2.36
32°.62	41°.87	50°1.19	59°1.66	68°2.48
33°.65	42°.90	51°1.23	60°1.73	69°2.61
34°.68	43°.93	52°1.28	61°1.80	70°2.75
35°.70	44°.97	53°1.33	62°1.88	71°2.90
36°.73	45°1.00	54°1.38	63°1.96	72°3.08
37°.75	46°1.04	55°1.43	64°2.05	73°3.27
38°.78	47°1.07	56°1.48	65°2.14	74°3.49

The time when a light bears 60° on the bow is noted, and also, of course, when it is abeam. The run in the interval is 10 miles. Required the distance from the light when abeam:

60° = 1.73
× 10

17.30 miles.

The above factors are proportionate to the sides of right-angled triangles for the angles subtended. Thus, 60° is the angle of the bearing from the course and its direction represents the hypotenuse of a right-angled triangle, in which the course and distance run represents the perpendicular. The base is the bearing abeam, and its distance depends on the length of the perpendicular multiplied by the factor corresponding to the angle of the bearing from the course steered. These factors are handy and very useful and they can be used at any time.

KEEP THE SAME COURSE.

Note.—It must be understood that in the taking of bearings the same course is supposed to be steered and made good between bearings. But this cannot always be done because currents, leeway, bad steering, etc., falsify the reckoning, which goes to show the necessity for extreme caution on the part of the navigator, also the value of an independent check where an error may lead into danger. There is no other profession whose members are obliged to be so constantly on the alert against accident brought about by freaks of nature rendering unreliable the very materials they have to work with.

ON OUR QUARTER-DECK

Where the Marine Review With Its Friends and Patrons Get Together and Talk It Over

It may not be out of place to mention the fact that "our quarter-deck" is very much unlike the quarter-deck of the olden time, where only the "Old Man" trod and ruled with the iron hand of dignity and discipline. Those were strenuous times compared with present day standards, but that they were necessary then is only too evident. On our quarter-deck you may say just what you think without running the risk of being knocked down with a belaying-pin or being keelhauled. This department can be made very interesting with a little help from our readers. If you have anything of interest, or of interest to friends, send it in. Offer suggestions; tell what you like and what you dislike. It is our desire to please you.

Capt. Duncan Buie: "If your Course Finder will assist the commander in determining the changes of the deviation of the compass from change of cargo and draught, and the course to be steered, its mission is not only a good one but an invaluable one as well. If it is as good as it appears to be from a mere inspection, it fulfils a long and suffering want. There is nothing that requires a shipmaster's attention more than the changes of deviation due to the various causes which tend to change the compasses in every lake vessel, so that if the Course Finder will render any assistance in this part of a master's duties, the Course Finder has done a good thing for the lake marine."

Another good feature about the Course Finder: If there is any question in your mind as to inaccuracy in the courses to be steered as directed by the Course Finder, verify it or prove it to the contrary. Any one can do this if they study the simple principle on which the book is based. It was for this reason that the author went to considerable pains in the explanation of the work. There is nothing difficult in understanding the system it is based upon, and almost anyone ought to be able to see for himself if the courses given in it are the correct thing. A clear understanding of the principles of the Course Finder will relieve the master of many of the trying details of his responsible position.

Capt. Geo. H. Banker, master steamer Linn: "I consider the Marine Review Course Finder a good thing, and will say all I can for it among my friends." This is the verdict of every master who has bought the book.

Capt. J. V. Trowell, master steamer City of Ottawa: "In the Course Finder I find on page 76, Question—'Give course and distance from Buffalo to Erie' an error in calculation which I judge is a typographical error rather than one of calculation in such a simple question. The one to which I allude is the addition of 6° 28′ Wly.
4 36
— — should be 11° 4′.
10° 59′

"Which is it?"

[It is a typographical error. However, the result of ½-pt. Var. figures out accurately, notwithstanding the calculation is in error. This is because the difference is only 5 minutes of arc. Thanks to you for the correction.—ED.]

The Clark Wireless Telegraph System has established a station at Buffalo and is now successfully operating at four points—Port Huron, Detroit, Cleveland and Buffalo. It is expected that the next station to go into commission will be that at Sault Ste. Marie.

The steamer Portage while lying at dock at Marquette on Tuesday of this week caught fire, and practically all of her upper works was destroyed. She will be temporarily repaired at Marquette.

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BIDS FOR DREDGING GREAT SALT POND, BLOCK ISLAND, R. I.

Bids received at the engineer office, Newport, R. I., for dredging entrance channel to Great Salt Pond, Block Island, R. I., were as follows:
Maritime Dredging Co., New York.....37.5c
John A. Seeley, New York.....39.5c
J. S. Packard Dredg. Co., Providence, R. I.28.5c
Charles M. Cole, Fall River, Mass.....32 c

BIDS FOR DREDGING IN BRUNSWICK HARBOR, GA.

Bids received by Lieut.-Col. Dan C. Kingman, corps of engineers, U. S. army, Savannah, Ga., for dredging inner and outer harbors at Brunswick, Ga., opened Aug. 22, were as follows:

	Item 1 520,000 cu. yds.	Item 2 230,000 cu. yds.	Item 3 1,500,000 cu. yds.	Item 4 board and lodging for inspectors per month.
Coastwise Dredging Co., Norfolk, Va.....	20c	16½c	23c	$20
P. Sanford Ross, Inc., Jersey City, N. J....	14.8c	17.8c	..	$20
Cataract Dredging Co., Baltimore Md.	16.4c	...	..	$20

It has been recommended that the contract be awarded to P. Sanford Ross, Inc., for lot 1, and to the Coastwise Dredging Co., for lots 2 and 3.

BIDS FOR DREDGING AT PROVIDENCE, R. I.

Bids received by Lieut.-Col. J. H. Willard, Corps of Engineers, U. S. Army, Newport, R. I., and opened Sept. 4, for dredging in Providence Harbor, R. I., were as follows.

	Per cubic yard, cents.
Maritime Dredging Co., New York..	12½
Atlantic Dredging Co., New York....	8 7/10
Columbia Dredging Co., New York...	7.94
John A. Seeley Dredging Co., New York	14
P. Sanford Ross, Inc., Jersey City, N. J.	8 9/10
J. S. Packard Dredging Co., Providence, R. I.	7 3/10

BIDS FOR SEA WALL AT FORT ST. PHILIP.

Bids received by Capt. James F. McIndoe, Corps of Engineers, U. S. Army, New Orleans, La., for the construction of a sea wall at Fort St. Philip, opened Aug. 30, were as follows:

Wemlinger Steel Piling Co., New York,	$ 94,010
*Richard M. Murphy, New Orleans, La.	96,802
W. G. Carey & Bro., New Orleans, La.	99,300
Cullen Friestedt Co., Chicago Ill...	99,859 99,955 102,302 104,900

*Bid accepted.

BIDS FOR DREDGING, ETC., AT TWO RIVERS, WIS.

Bids received by Maj. W. V. Judson, Corps of Engineers, U. S. Army, Milwaukee, Wis., for removing old pier, building pile pier, dredging, etc., at Two Rivers, Wis., opened Sept. 3, were from Greiling Bros., Green Bay, Wis., for $64,945, and August Rieboldt & Joseph Wolter, Sturgeon Bay, Wis., for $43,680.

BIDS FOR PUGET SOUND NAVY YARD WALL.

The bureau of yards and docks, navy department, Washington, D. C., received the following bids, Aug. 24, for the construction of a quay wall of concrete at the Puget Sound navy yard at Bremerton, Wash.: T. Ryan, Seattle, Wash., $26,560; International Contract Co., Seattle, Wash., $41,290.

BIDS FOR DREDGING SKIDAWAY NARROWS, GA.

Bids received by Lieut.-Col. Dan C. Kingman, corps of engineers, U. S. army, Savannah, Ga., and opened by him on Aug. 23, were as follows: Southern Dredging Co., Mobile, Ala., 25 cents per yard; Savannah Dredging Co., Savannah, Ga., 13¾ cents per yard; H. H. Gatken, Savannah, Ga., 14⅞ cents per yard.

The bid of the Savannah Dredging Co. has been recommended for acceptance. The work involves the removal of about 238,000 cubic yards of material from Skidaway Narrows, Ga.

DREDGING CANAL AT SEWELL BAY, S. C.

Bids for dredging a canal between Sewell bay and McLellanville, S. C., received by E. R. Stewart, captain of engineers, United States army, Charleston, S. C., and opened Aug. 20, were as follows:

Item 1, sand mud, etc.; item 2, stumps; item 3, logs. Edward M. Graves, Commercial Bank building, Cleveland, O., item 1, 20c; 2, $50; 3, $20. Simons Mayrant Co., Charleston, S. C., item 1, 27.7c; 2, $2; 3, $2. Savannah Dredging Co., Savannah, Ga., item 1, 23⅝c; 2, $6; 3, $5. Southern Dredging Co., Mobile, Ala., item 1, 37c; 2, $30; 3, $8.

DREDGING CONNECTICUT RIVER.

Abstract of proposals for dredging at mouth of Connecticut river, Conn., received in response to advertisement dated July 20, 1907, and opened Aug. 19, 1907, by Major Harry Taylor, corps of engineers.

Number of Proposal.	Bidders.	Price per cu. yd. for dredging estimated amount of 60,000 cu. yds.
1.	The W. H. Beard Dredging Co., New York City.....	24c
2.	Morris & Cumings Dredging Co., New York City..	36c
3.	Maritime Dredging Co., New York City	23.3c
4.	*Hartford & New York Transportation Co., Hartford, Conn.	20c
5.	Atlantic Dredging Co., New York City	32c
6.	John P. Randerson.....	18c

*Bid of John P. Randerson received too late for consideration; award made to Hartford & New York Transportation Co.

DREDGING NORFOLK HARBOR.

Abstract of bids opened Sept. 4 by Maj. Joseph E. Kuhn, Norfolk, Va., for dredging eastern branch, Elizabeth river, Norfolk, Va.

Name and Address of Bidder.	Total Amount Bid.
River & Harbor Improvement Co., Philadelphia, Pa.	$70,050.00
L. M. Lewis, Norfolk, Va.....	58,775.00
Coastwise Dredging Co., Norfolk, Va.	57,350.00
Norfolk Dredging Co., Norfolk, Va.	54,175.00

BIDS FOR DREDGES.

Bids received by Major J. C. Sanford, corps of engineers, U. S. army, Philadelphia, Pa., Aug. 30, for the construction of two steel twin screw suction dredges for New York harbor, were as follows:

Bidders	Construction of one dredge	Construction of two dredges
Maryland Steel Co., Sparrow's Point, Md.....	$375,000	$742,850
Fore River Ship Building Co., Quincy, Mass....	510,000	998,000
New York Ship Building Co., Camden, N. J.....	415,000	790,000
Newport News Ship Building & Dry Dock Co., Newport News, Va.....	420,000	820,000

The bid of the Maryland Steel Co. has been recommended for acceptance.

BIDS FOR NAVAL SUPPLIES.

Bids received at the bureau of supplies and accounts, Navy Department, Washington, D. C., for material and supplies for navy yards, opened Sept. 10, included the following:

SCHEDULE 245—CONSTRUCTION AND REPAIR.

Class 31—Portsmouth—One Steam Pump Brake Windlass.
American Ship Windlass Co., Providence, R. I. .....$ 695.00
Hyde Windlass Co., Bath, Me..... 1,475.00

SCHEDULE 246—CONSTRUCTION AND REPAIR.

Class 32—Brooklyn—Two Generating Sets Complete with Switchboard and Spare Parts.
General Electric Co., Schenectady, New York $11,005.00
Northern Electrical Mfg. Co., Madison, Wis. 12,995.00
B. F. Sturtevant Co., Hyde Park, Mass. 11,380.00
Westinghouse Electrical & Mfg. Co., Baltimore, Md. 7,995.00
Western Electrical Co., 463 West Street, New York 10,880.00

SCHEDULE 259—EQUIPMENT.

Class 111—Norfolk—One Motor Generator.
Northern Electrical Mfg. Co., Madison, Wis. .....$ 899.00

SCHEDULE 260—ORDNANCE.

Class 124—Washington—470,000 Nickel Steel Seamless Drawn Tubes.
Central Metal & Supply Co., 609 East Lombard Street, Baltimore, Md...$ 4,700.00
Class 131—Washington—38 Steam Indicators.
R. W. Geldart, 2 Stone St., New York .....$ 1,710.00
Knox & Co., 99 John St., New York 2,242.00
Vermilye & Power, 17 Battery Pl., New York 2,401.60
Manning, Maxwell & Moore, 85 Liberty St., New York..... 2,280.00

SCHEDULE 261—CONSTRUCTION AND REPAIR.

Class 142—Boston—One Series Wound Motor.
General Electric Co., Schenectady, N. Y.$440.00
Northern Electrical Mfg. Co., Madison, Wis. 894.00
Sprague Electrical Co., 537 W. 23d st., New York 532.00
B. F. Sturtevant Co., Hyde Park, Mass. 622.50
Westinghouse Electrical & Mfg. Co., Baltimore, Md. 333.00
Western Electrical Co., 463 West St., New York 536.00
Excelsior Equipment Co., Pittsburg, Pa. 400.00

SCHEDULE 262—STEAM ENGINEERING.

Class 157—Newport—1,200 Condenser Ferrules and Two Tube Expanders.
Knox & Co., 99 John St., New York..$ 76.00
Manhattan Supply Co., 127 Franklin St., New York 157.00
Newport Engineering Works, Newport, R. I. 86.00
*Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md.....
*Bid rejected.

SCHEDULE 264—SUPPLIES AND ACCOUNTS.

Class 202—League Island—168 Hydrometers and 144 Thermometers.
Hochman & Maurer, 85 Chambers St., New York $302.40
R. Hoen Co., 84 Evergreen Ave., Brooklyn, N. Y. 279.84
Manhattan Supply Co., 127 Franklin St., New York 293.76
A. E. Moeller, 261 Sumpter St., Brooklyn, N. Y. 212.16
Philadelphia Thermometer Co., 9th & Arch Sts., Philadelphia, Pa..... 215.52
Queen & Co., 807 Arch St., Philadelphia 273.60
J. B. Roache, 350 Fulton St., Brooklyn, N. Y. 286.32
Fred A. Schmidt, Washington, D. C... 275.04
*Vermilye & Power, 17 Battery Pl., New York .....
Williams, Brown & Earle, 908 Chestnut St. Philadelphia 237.60
Central Metal & Supply Co., 609 E. Lombard St., Baltimore, Md..... 283.68
Manning, Maxwell & Moore, 85 Liberty St., New York 279.60
*Informal.
Class 204—Norfolk—2,000 Sounding Tubes.
John Bliss & Co., 128 Front St., New York $400.00
Edw. R. Costello, 630 Myrtle Ave., Brooklyn, N. Y. 350.00
T. S. & J. D. Negus, 140 Walter St., New York 400.00

BIDS ON CANAL CIRCULAR NO. 382.

Bids in response to Canal Circular No. 382 for sanitary fixtures, pipe, etc., for use on the Panama canal were received and opened Aug. 22. Among the bids were the following:

Class 16—Five Automatic Float Valves.
Central Metal & Supply Co., Baltimore, Md. ..... $250.
*Fairbanks, Morse & Co., 169 Franklin St., Chicago, Ill..... 67.50
Fox Bros. & Co., 126 Lafayette St., New York 264.50
210.
Handlum-Buck Mfg. Co., St. Louis, Mo. 131.25
Kieley & Mueller, 34 W. 13th St., New York ..... 125.
Manhattan Supply Co., 127 Franklin St., New York ..... 299.
Manning, Maxwell & Moore, 85 Liberty St., New York..... 242.
123.75
Prentiss Tool & Supply Co., 115 Liberty St., New York..... 66.
Excelsior Equipment Co., Pittsburg, Pa. 123.75

Class 18—One Engine and Dynamo.
A. D. Granger & Co., 90 West St., New York ..... $595.
International Electric & Engr. Co., 150 Nassau St., New York..... 620.
B. F. Sturtevant Co., Hyde Park, Mass. 665.50

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Western Electrical Co., 463 West St., New York ..... 512.
*Westinghouse Elec. & Mfg. Co., East Pittsburg, Pa. ..... 508.
Excelsior Equipment Co., Pittsburg, Pa. 599.
*Awarded contract.
Class 19—One Switchboard, Complete.
Central Electric Co., 264 5th Ave., Chicago, Ill. ..... $ 80.
72.
Fox Bros. & Co., 126 Lafayette St., New York ..... 78.
A. D. Granger Co., 90 West St., New York ..... 125.
International Elec. & Engr. Co., 150 Nassau St., New York..... 89.50
85.50
B. F. Sturtevant Co., Hyde Park, Mass. 172.50
Vermilye & Power, 1 Battery Place, New York ..... 83.
Walker Electrical Co., 2318 Noble St., Philadelphia, Pa. ..... 106.
Western Electrical Co., 463 West St., New York ..... 70.
*Westinghouse Elec. & Mfg. Co., East Pittsburg, Pa. ..... 53.
Excelsior Equipment Co., Pittsburg, Pa. 85.
*Awarded contract.
Class 26—12,000 Ft. Close Link Coil Chain, Galvanized.
Hayden-Corbett Chain Co., 4 Burling Slip, New York..... $5,660
I. B. Kendall, Washington, D. C..... 6,580
*Lebanon Chain Works, Lebanon, Pa.. 4,940
New Jersey Fdry. & Mach. Co., 9 Murray St., New York..... 6,702
Excelsior Equipment Co., Pittsburg, Pa. 6,567
W. Bingham Co., Cleveland, O..... 6,370
*Awarded contract.
Class 28—Three Flyball Governors.
Gardener Governor Co., Quincy, Ill..... $73.50
Handlan-Buck Mfg. Co., St. Louis, Mo.. 77.25
Manning, Maxwell & Moore, 85 Liberty St., New York..... 74.34
*Vermilye & Power, 17 Battery Place, New York 59.70
*Awarded contract.
Class 30—Marine Electric Fixtures, 2,600 Ft. of Copper Wire, Etc.
International Elec. & Engr. Co., 150 Nassau St., New York..... $239.77
National Electric Supply Co., Washington, D. C..... 255.80
W. R. Ostrander & Co., 22 Dey St., New York 276.45
Western Electrical Co., 463 West St., New York 238.87
Class 38—100 Drill Hammers, 100 Extra Handles.
Berry & Aikens, 36th & Wharton Sts., Philadelphia, Pa. $85.00
Fox Bros. & Co., 126 Lafayette St., New York 48.40
Manning, Maxwell & Moore, 85 Liberty St., New York..... 39.
*Vermilye & Power, 17 Battery Place, New York ..... 44.
*Awarded contract.

NAVAL BIDS OPENED.

Bids received by the bureau of supplies and accounts, navy department, and opened Sept. 3, for material and supplies for the navy yards included the following:

Schedule 193—Steam Engineering.

Class 51—Puget Sound—9,000 lbs. Condenser Tubes and 520 lbs. Brass Tubing.
Benedict & Burnham Mfg. Co., 99 John St., New York $3,049.40
Central Metal & Supply Co., Baltimore, Md. 3,586.40
Holbrook, Merrill & Stetson, Oakland, Cal. 3,000
Nubian Paint & Varnish Co., Chicago, Ill. 2,970.40
Pacific Hardware & Steel Co., 253 Broadway, New York 2,970.40
Randolph-Clowes Co., Waterbury, Conn.. 3,036.72
Rome Brass & Copper Co., Rome, N. Y.. 2,979.40
Schedule 196—Supplies and Accounts.
Class 87—Mare Island—2,000 ft. of Garden Hose.
Boston Belting Co., 256 Devonshire St., Boston, Mass. $550
Excelsior Equipment Co., Pittsburg, Pa.. 422.50
Bowers Rubber Works, San Francisco, Cal. ..... 380.
Class 88—Mare Island—270 Ft. Suction Hose.
Boston Belting Co., 256 Devonshire St., Boston, Mass. .....$1,080.
Gutta Percha & Rubber Mfg. Co., 116 Duane St., New York..... 928.80
Manning, Maxwell & Moore, 85 Liberty St., New York 1,004.40
New York Belting & Packing Co., 91 Chambers St., New York..... 931.50
W. R. Thompson, Brooklyn, N. Y.... 931.50
Bowers Rubber Works, San Francisco, Cal. ..... 648.
Class 89—Mare Island—1,000 Ft. Steam Hose.
Boston Belting Co., 256 Devonshire St., Boston, Mass. .....$650.
Gutta Percha & Rubber Mfg. Co., 116 Duane St., New York..... 780.40
Bowers Rubber Works, San Francisco, Cal. ..... 320.
Class 90—Mare Island—850 lbs. Flax Packing.
Dunham, Carrigan & Hayden Co., San Francisco, Cal. $167.79
Double Service Packing Co., 430 Walnut St., Philadelphia, Pa..... 229.50
Excelsior Equipment Co., Pittsburg, Pa.. 334.75
Schedule 198—Supplies and Accounts.
Class 101—Mare Island—43 Dozen Cocks.
Central Metal & Supply Co., Baltimore, Md. .....$385.
Excelsior Equipment Co., Pittsburg, Pa.... 432.55
A. B. Sands & Sons Co., 22 Vesey st., New York ..... 392.
Class 103—Mare Island—20 Dozen Brass Angle Valves.
Baker & Hamilton, 900 Third St., San Francisco, Cal. $510.25
Buckeye Iron & Brass Works, Dayton, O. 468.
Central Metal & Supply Co., Baltimore, Md. ..... 420.
Hartman Co., 1235 N. Front St., Philadelphia, Pa. ..... 430.
Knox & Bro., 76 John St., New York.... 556.75
Lunkenheimer Co., Cincinnati, O..... 462.
Manning, Maxwell & Moore, 85 Liberty St., New York..... 368.20
Class 104—Mare Island—Round Water Gage Glasses for Boilers.
Baker & Hamilton, 900 Third St., San Francisco, Cal. $364.60
Central Metal & Supply Co., Baltimore, Md. 482.50
Excelsior Equipment Co., Pittsburg, Pa.. 267.20
Knox & Bro., 76 John St., New York.... 229.63
Montgomery & Co., 105 Franklin St., New York ..... 363.
Schedule 230—Construction and Repair.
Class 223—Brooklyn Edison Ratchet Windlasses.
American Ship Windlass Co., Providence, R. I. $48.60
Marine Mfg. & Supply Co., 158 South St., New York ..... 46.
New Jersey Foundry & Machine Co., 9 Murray St., New York..... 46.
Class 224—Brooklyn—Four Suction Force Pumps.
Central Metal & Supply Co., Baltimore, Md. $73.40
R. W. Geldart, 2 Stone St., New York.... 70.96
I. B. Kendall, Washington, D. C..... 77.
Knox & Bro., 76 John St., New York.... 67.20
Manning, Maxwell & Moore, 85 Liberty St., New York..... 75.04
Manhattan Supply Co., 127 Franklin St., New York 77.60
Montgomery & Co., 105 Franklin St., New York ..... 73.
Vermilye & Power, 17 Battery Place, New York 56.60
Class 39—2,000 Pounds Ship's Felt.
Berry & Aikens, 36th & Wharton Sts., Philadelphia, Pa. $1,980
2,500
1,600
2,000
Woodward, Wight & Co., New Orleans, La. 108
No awards have as yet been announced for classes 26, 30 and 39.

BIDS FOR CANAL CIRCULAR NO. 385.

Bids were opened Aug. 22 by H. F. Hodges, general purchasing officer of the Isthmian Canal commission, Washington, D. C., for various supplies, among which were the following items:

Class 1—Yawls or row boats.
*F. S. Banks & Co., New York.....$ 720
Fox Bros & Co., New York..... 957
1,105
1,188
Racine Boat Co., Racine, Wis..... 996
*Contract awarded.
Class 2—Skiffs.
*F. S. Banks & Co., New York.....$ 897.60
Fox Bros. & Co., New York..... 1,188
D. Lyon Skiff Co., Leavenworth, Ind.. 1,200
*Contract awarded.
Class 3—Oars.
*F. S. Banks & Co., New York.....$253.08
Fox Bros. & Co., New York..... 312.14
*Contract awarded.

BIDS FOR CANAL CIRCULAR NO. 386.

Bids received by the general purchasing officer of the Isthmian canal commission in response to Circular No. 386, and opened Sept. 3, include the following:

Class 30—Two Hoisting Engines.
Donegan & Swift, 6 Murray St., New York ..... $3,150.
Lambert Hoisting Engine Co., Newark, N. J..... 3,690.
Lidgerwood Mfg. Co., 96 Liberty St., New York..... 3,400.
2,780.
Mead-Morrison Mfg. Co., Cambridge, Mass. ..... 3,900.
Motley, Green & Co., 66 Broad St., New York..... 3,627.
New Jersey Foundry & Machine Co., 9 Murray St., New York..... 3,044.
New York Cableway & Engineering Co., 2 Rector St., New York..... 2,934.
Pacific Engineering Co., Railroad Ave. & Washington St., Seattle, Wash.. 4,050.
Pittsburg Industrial Iron Works, Westinghouse bldg., Pittsburg, Pa..... 3,915.20
Queen City Supply Co., 201 Elm St., Cincinnati, O..... 2,550.
Charles E. Robidoux, 1012 Chemical bldg., St. Louis, Mo..... 2,760.
Stroudsburg Engine Works, Stroudsburg, Pa..... 2,800.
Williamson Bros. Co., Aramingo Ave. & Cumberland St., Philadelphia..... 2,300.
Class 31—Four Hoisting Engines.
Donegan & Swift, 6 Murray St., New York ..... $4,500.
Fox Bros. & Co., 126 Lafayette St., New York..... 3,896.
Lambert Hoisting Engine Co., Newark, N. J. ..... 4,340.
Lidgerwood Mfg. Co., 96 Liberty St., New York ..... 4,020.
Mead-Morrison Mfg. Co., Cambridge, Mass. ..... 4,200.
Motley, Green & Co., 66 Broad St., New York ..... 4,624.
New Jersey Foundry & Machine Co., 9 Murray St., New York..... 4,164.
3,980.
New York Cableway & Engineering Co., 2 Rector St., New York..... 4,300.
Pacific Engineering Co., Railroad Ave. & Washington St., Seattle, Wash... 4,050.
Pittsburg Industrial Iron Works, Pittsburg, Pa. ..... 3,944.
Queen City Supply Co., 201 Elm St., Cincinnati, O. ..... 3,600.
Charles E. Robidoux, 1012 Chemical bldg., St. Louis, Mo..... 4,340.
Stroudsburg Engine Works, Stroudsburg, Pa. ..... 4,000.
Williamson Bros. Co., Aramingo Ave. & Cumberland St., Philadelphia, Pa. 3,000.
Class 32—One Vertical Boiler, 128 H. P.
P. Delaney & Co., Newburg, N. Y... $2,150.
Donegan & Swift, 6 Murray St., New York ..... 1,975.
Fox Bros. & Co., 126 Lafayette St., New York ..... 1,574.
A. D. Granger Co., 90 West St., New York 196.50
1,477
1,298.
Manning, Maxwell & Moore, 85 Liberty St., New York 1,453.00
1,737.67
2,080.
Phoenix Iron Works Co., Meadville, Pa. ..... 1,323.
Stroudsburg Engine Works, Stroudsburg, Pa. ..... 1,365.
Class 34—2,000 Ft. Plow Steel Wire Cable.
H. E. Boucher Mfg. Co. 91 Maiden Lane, New York.....$ 658.
Broderick & Bascom Rope Co., 805 N. Main St. St. Louis, Mo..... 624.
693.50
Macomber-Whyte-Moon Co., 120 Center St., New York ..... 560.
Manhattan Supply Co., 127 Franklin St. New York 1,056.80
New Jersey Foundry & Machine Co., 9 Murray St., New York..... 672.
Southern Exporting Co., 204 Carondelet St., New Orleans, La..... 637.
Excelsior Equipment Co., Pittsburg, Pa.. 1,012.50
U. S. Steel Products Export Co., 24 State St., New York..... 450.
Class 36—Two Hydraulic Jacks, 30 Tons Capacity.
H. E. Boucher Mfg. Co., 91 Maiden Lane, New York .....$ 115.50
Brooklyn Forge & Supply Co., 21 Franklin St., Brooklyn, N. Y..... 221.50
Fox Bros. & Co., 126 Lafayette St., New York ..... 470.
Frevert Machinery Co., 18 Dey St., New York 144.38
Manning, Maxwell & Moore, 85 Liberty St., New York..... 191.04
27.60
Motley, Green & Co., 66 Broad St., New York 160
Excelsior Equipment Co., Pittsburg, Pa.. 222.
Class 42—One Tug Boat.
Baker, Whiteley Coal Co., 509 Keyser St., Baltimore, Md. $60,000
A. H. Bull & Co., 10 Bridge St., New York 60,000

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Samuel Holmes, 66 Broad St., New York	31,500
	32,500
	42,000
	50,000
	60,000
Motley, Green & Co., 66 Broad St., New York	44,286
F. H. Weeks, 17 State St., New York	63,000
	73,000
	79,000
	42,000
	60,000
	55,000
	52,000
	30,000

ISTHMIAN CANAL BIDS.

Bids were opened Aug. 26 at the office of the Isthmian canal commission for furnishing six steel barges. On item 1, calling for six steel barges erected, completed and delivered on the isthmus, no bids were received. For item 2, calling for six steel barges, knocked down and securely packed for ocean shipment and delivered on the isthmus, the bids were as follows: Maryland Steel Co., Sparrow's Point, Md., $125,700; the Moran Co., Seattle, Wash., $110,000, barges knocked down, f. a. s. at Seattle, $98,000; Motley, Green & Co., 66 Broad street, New York, $88,000; Newport News Ship Building & Dry Dock Co., Newport News, Va., $120,000; U. S. Steel Products Export Co., 21 State street, New York, $135,000.

CANAL CIRCULAR NO. 388.

Isthmian canal commission's Circular No. 388, bids in response to which are to be opened Sept. 25, by the general purchasing officer of the commission, calls for the following items: Class 1, twelve steam shovels, type B. Class 3, two cross-compound, steam condensing and cross compound air compressors. Class 4, horizontal water tube boilers, sheet steel smoke box and smokestack, etc. Class 5, Duplex boiler feed pump, vertical water tube feed water heater, pipe and condenser. Class 6, valves, tees and cast iron pipe. Class 7, one tandem compound engine. Class 8, one direct current generator. Class 9, two induction motors and six transformers. Class 28, 30 lbs. ship clamp screws. Class 33, 24 brass steam whistles. Class 34, 12 balanced nonreturn steam traps. Class 37, 20 rubber sleeves for suction dredge. Class 38, 5,400 ft. canvas belting. Class 39, 300 coils manila rope. Class 40, 12,000 ft. special manila drilling or oil well cable. Class 41, 84 coils manila cor'ing. Class 42, 500 gals. marine boiler compound.

BIDS FOR NAVAL TRAINING STATION, NORTH CHICAGO, ILL.

Bids were opened by the bureau of navigation at Washington, Aug. 26, for furnishing labor and material necessary to complete the construction of houses for officers' quarters, naval training station, North Chicago, Ill., as follows: J. C. Orrel Co., Chicago, Ill., $58,000; James Corse, Racine, Wis., $54,254.

No bids were received for grading to be done at this station.

BIDS FOR EMBANKMENT AT GOVERNOR'S ISLAND.

Bids received by Lieut.-Col. W. L. Marshall, corps of engineers, U. S. army, New York city, for furnishing material and building embankment at Governor's Island, New York harbor, were as follows:

Bidder.	Inner section per cu. yard cents	Outer section per cu. yard cents	Both sections per cu. yard cents
Henry Steers, Inc., 17 Battery Place, New York	17	22.6	20.5
Morris & Cummings Dredging Co., 17 State St., N. Y	..	..	26
U. S. Dredging & Contracting Co., Jersey City, N. J.	35	33	27.3
Charles A. Brown, 129 Broad St., New York	25	25	25

BIDS FOR BOILERS FOR LIGHTHOUSE TENDER.

Bids were opened at the office of the lighthouse board in Washington, D. C., Sept. 3, for furnishing the boilers for the government lighthouse tender Pansy, f. o. b. works, as follows:

Item 1, two Scotch marine boilers of 130 lbs. pressure per square inch. Item 2, two Scotch marine boilers of 180 lbs. pressure per square inch.

Bidder	Item 1	Item 2
New York Ship Building Co., Camden, N. J.	$8,150	$ 8,950
Harlan & Hollingsworth Corp., Wilmington, Del.	7,760	8,500
Newport News Ship Building & Dry Dock Co., Newport News, Va.	8,200	9,200
Baltimore Dry Dock Co., Port Richmond, N. Y.	7,860	8,950
Shooter Island Ship Yard Co., Mariner's Island, N. Y.	7,500	10,000
Portland Co., Portland, Me.	8,750	9,495
Bath Iron Works, Bath, Me.	8,650	8,900

IMPROVING HARBOR AT TWO RIVERS, WISCONSIN.

Abstract of proposals for removing old pier, building pile pier, dredging, etc., at Two Rivers harbor, Wis., received and opened Sept. 3, 1907, by Major W. V. Judson, Corps of Engineers, Milwaukee, Wis.

	Greiling Bros., Green Bay, Wis.	August Rieboldt & Joseph Wolter, Sturgeon Bay, Wis.
Removing 600 lin. ft. old pier, per lin. ft.	$21.00	$12.00
12,600 lin. ft. round piles, per lin. ft.	0.35	0.28
Making 200,000 ft. B. M. sheet piles of plank to be furnished by U. S., and driving same, per M. ft. B. M.	20.00	12.00
Framing 160,000 ft. B. M. timber to be furnished by U. S., per M. ft. B. M.	20.00	12.00
12,000 lbs. wrought iron or steel drift bolts, per lb.	6c	5c
41,250 lbs. wrought iron or steel screw bolts and tie-rods, per lb.	6c	6c
4,000 lbs. wrought iron and wire spikes, per lb.	6c	5c
7,000 tons of stone, per ton of 2,000 lbs.	1.90	1.20
Dredging 150,000 cubic yards, per cubic yard.	16c	11½c
Total of bid	$64,945.50	$43,680.50

BIDS FOR EXCAVATION, CAPE PORPOISE HARBOR, ME.

Bids for rock excavation in Cape Porpoise Harbor, Me., opened Aug. 30 in the office of Maj. George A. Zinn, corps of engineers, U. S. army, Portland, Me., were as follows.

Eastern Dredging Co., Boston, Mass.	$50,169.60
Simon J. Donovan, East Boston, Mass.	58,792.50
John J. Fitzpatrick, Plattsburg, N. Y.	71,178.12
Johnston & Virden, Lewes, Del.	60,882.90

BIDS FOR BUOYS AND APPENDAGES.

Bids received at the office of the third lighthouse district at Tompkinsville, N. Y., and opened Aug. 21, for furnishing moorings for vessels and buoys, buoys and appendages, were as follows:

CHAIN FOR BUOYS.

*Seneca Chain Co., Kent, O.	$13,807.29
F. L. Banks & Co., New York	13,902.43
Lebanon Chain Works, New York	14,225.08
Hayden Corbett Chain Co., New York	15,043.87

LOT 2. CHAIN FOR BUOYS.

*Seneca Chain Co., Kent, O.	$19,327.39
Lebanon Chain Works, New York	20,206.16

CHAIN FOR LIGHT VESSELS.

*Lebanon Chain Works, New York	$26,491.07
Seneca Chain Co., Kent, O.	29,698.22

CAST IRON MUSHROOM ANCHORS.

*Weatherly Foundry & Machine Co., Weatherly, Pa.	$ 1,125.00
M. H. Treadwell & Co., of Pennsylvania, Lebanon, Pa.	1,578.00
New Jersey Foundry & Machine Co., New York	1,602.00
Richmond Iron Works, Richmond, Va.	1,860.00
American Ship Windlass Co., Providence, R. I.	2,118.75

BRIDLE CHAINS.

*Lebanon Chain Works, New York	$ 388.13

SWIVELS AND SHACKLES COMPLETE.

*Fletcher & Crowell Co., Portland, Me.	$ 3,708.22
New Jersey Foundry & Machine Co., New York	4,641.56

BUOY SHACKLES.

*Fletcher & Crowell Co., Portland, Me.	$10,606.82
New Jersey Foundry & Machine Co., New York	10,863.60
Seneca Chain Co., Kent, O.	12,292.80

ANCHOR SHACKLES.

*Fletcher & Crowell Co., Portland, Me.	$ 373.62
New Jersey Foundry & Machine Co., New York	383.20

*Bids accepted.

BIDS FOR DREDGING PUYALLUP WATERWAY.

Bids, received by Maj. H. M. Chittenden, Corps of Engineers, U. S. Army, Seattle, Wash., for dredging Puyallup Waterway, and opened Sept. 2, were submitted by the following firms: A. W. Tweeden & Co., Tacoma, for the Northwest Bridge Co.; North American Dredging Co., San Francisco, Cal.; Puget Sound Bridge & Dredging Co., Seattle; Richmond Dredging Co., San Francisco, Cal.; International Contracting Co., Seattle; Pacific Coast Dredging & Reclamation Co., San Francisco, Cal. The Northwest Bridge Co.'s bid was the lowest but as yet the contract has not been awarded.

WATERWAYS COMMISSION.

(Continued from page 25.)

and Mrs. Moon; Joseph E. Ransdell of Louisiana and Mrs. Ransdell; S. M. R. Sparkman of Florida and Mrs. Sparkman; Mrs. J. Adam Bede; James H. Cassidy, secretary of the committee, and Mrs. Cassidy. Among those who met them at dinner were Gen. Jared A. Smith, Col. M. C. Townsend, Harvey D. Goulder, City Engineer Carter, City Solicitor Baker, President Springborn of the service board, W. A. Hawgood, George P. McKay, Mrs. and Mrs. George A. Marr, H. R. Groff, W. R. Warner, J. G. W. Cowles, C. L. Pack, Col. J. J. Sullivan, Harry Coulby, S. P. Fenn, T. S. Grasselli, R. A. Harmon, C. S. Howe, Thomas L. Johnson, C. A. Paine, Henry A. Taylor and W. B. Davock.

The members of the Inland Waterways Commission recently appointed by President Roosevelt, and of which Hon. T. E. Burton is chairman, will make a comprehensive tour of the great lakes and the Mississippi valley. The commission will assemble on Saturday in Cleveland and will board the bulk freighter Thomas F. Cole of the Pittsburg Steamship Co.'s fleet at Lorain on that day. Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., will act as host on the trip to Duluth. From Duluth the commission will proceed along the Mississippi valley, holding a succession of important meetings, and will be joined either at St. Louis or Memphis by President Roosevelt. The scope of this commission is very broad, having to study the problem of transportation both in relation to waterways and railways.

The steamer Harvey H. Brown of the Northwestern Transit Co.'s fleet ran onto the shoal near the harbor entrance while going into Buffalo harbor on Tuesday. A lighter was sent to release her.

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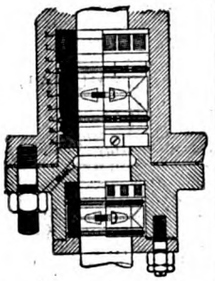

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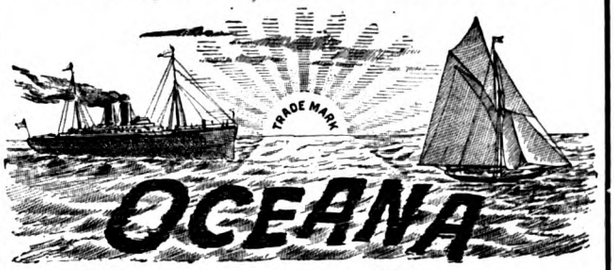

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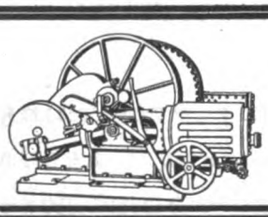
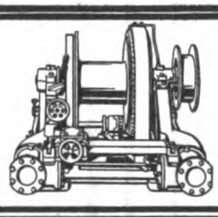
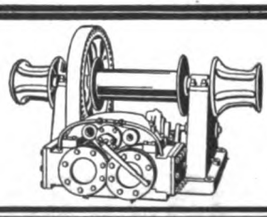

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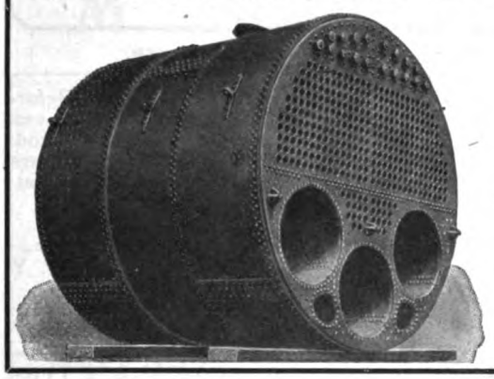

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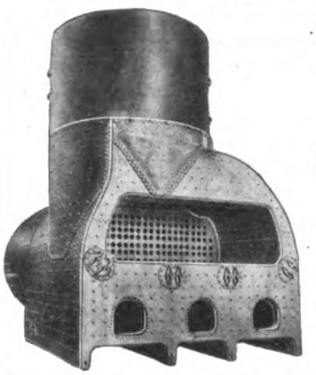

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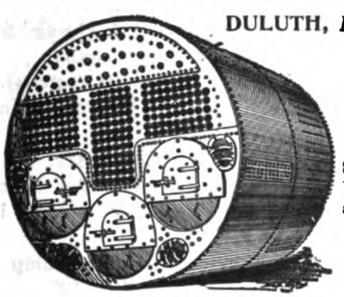

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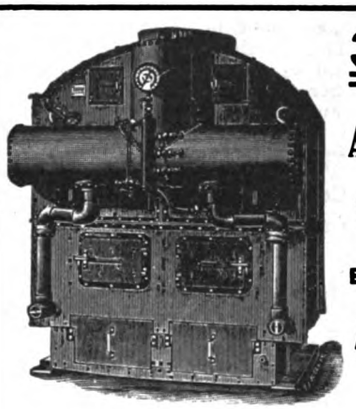

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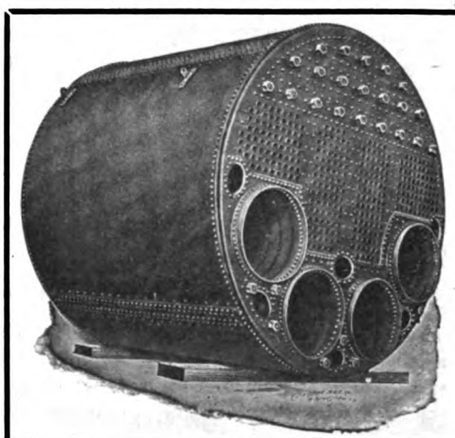

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PROPOSALS.

U. S. Engineer Office, Jones Building, Detroit, Mich., Aug. 26, 1907. Sealed proposals for dredging Section 1, Plan B, Detroit River, will be received here until 3 P. M. October 8, 1907, and then publicly opened. Information furnished on application. Chas. E. L. B. Davis, Col., Engrs.

U. S. Engineer Office, Jones Bldg., Detroit, Mich., August 26, 1907. Sealed proposals for rock and earth excavation, Section 2, Plan B, Detroit River, will be received here until 3 P. M., October 7, 1907, and then publicly opened. Information furnished on application. Chas. E. L. B. Davis, Col., Engrs.

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CLEVELAND.

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Great Lakes Engineering Works.. .....Detroit.

AIR PORTS, DEAD LIGHTS, Etc.

Marine Mfg. & Supply Co..... ..... New York.

AIR PUMPS AND APPLIANCES.

Fore River Ship & Engine Co..... ..... Quincy, Mass.
Great Lakes Engineering Works... ..... Detroit.

ANCHORS.

Bowers, L. M. & Co..... ..... Binghamton, N. Y.

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Detroit Ship Building Co...Detroit.
Great Lakes Engineering Works... ..... Detroit.

ASH EJECTORS.

Great Lake Engineering Works.... ..... Detroit.

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Gilchrist, Albert J.....Cleveland.
Goulder, Holding & Masten..... ..... Cleveland.
Hoyt, Dustin & Kelley...Cleveland.
Jenkins, Russell & Eichelberger.... ..... Cleveland.
Kremer, C. E.....Chicago.
MacDonald, Ray G.....Chicago.
Marshall, Alexander..Duluth, Minn.
Maytham, Frank.....Buffalo.
Shaw, Warren, Cady & Oakes..... ..... Detroit.
Spencer, H. R.....Duluth, Minn.

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Truscott Boat Mfg. Co..... .....St. Joseph, Mich.

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Dearborn Drug & Chemical Works. ..... Chicago.

BOILER MANUFACTURERS.

Almy Water Tube Boiler Co..... ..... Providence, R. I.
American Ship Building Co..... ..... Cleveland.
Atlantic Works..East Boston, Mass.
Briggs, Marvin.....New York.
Chicago Ship Building Co..Chicago.
Cramp, Wm. & Sons..Philadelphia.
Delany, P. & Co...Newburgh, N. Y.
Detroit Ship Building Co..Detroit.
Fletcher, W. A. & Co..... .....Hoboken, N. J.
Fore River Shipbuilding Co..... .....Quincy, Mass.
Great Lakes Engineering Works... ..... Detroit.
Kingsford Foundry & Machine Works.....Oswego, N. Y.
Maryland Steel Co..... .....Sparrow's Point, Md.
Marine Iron Works.....Chicago.
Milwaukee Dry Dock Co..... ..... Milwaukee.
New York Shipbuilding Co..... .....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co.....Duluth, Minn.
Quintard Iron Works Co..... .....New York.
Roberts Safety Water Tube Boiler Co..... New York.
Superior Ship Building Co..... .....Superior, Wis.
Taylor Water Tube Boiler Co..... ..... Detroit.
Toledo Ship Building Co....Toledo.

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Penberthy Injector Co..... .....Detroit, Mich.

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Fore River Ship & Engine Co..... .....Quincy, Mass.
Great Lakes Engineering Works... ..... Detroit.

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Brown Hoisting & Conveying Machine Co.....Cleveland.

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Martin-Barriss Co.....Cleveland.

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U. S. Graphite Co., Saginaw, Mich.

CANVAS SPECIALTIES.

Baker & Co., H. H.....Buffalo.
Bunker, E. A.....New York.
Upson-Walton Co.....Cleveland.

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American Ship Windlass Co..... .....Providence, R. I.
Dake Engine Co..... .....Grand Haven, Mich.
Hyde Windlass Co.....Bath, Me.
Marine Iron Wks.....Chicago, Ill.
Marine Mfg. & Supply Co..... .....New York.

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Smooth-On Mfg. Co..... .....Jersey City, N. J.

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General Electric Co..... .....Schenectady, N. Y.

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Seneca Chain Co.....Kent, O.
Woodhouse Chain Works..... .....Trenton, N. J.

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Boston & Lockport Block Co..... ..... Boston, Mass.
Republic Belting & Supply Co..... ..... Cleveland.

CHARTS.

Penton Publishing Co.....Cleveland.

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Ritchie, E. S. & Sons..... .....Brookline, Mass.

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Hanna, M. A. & Co.....Cleveland.
Lorain Coal & Dock Co..... ..... Cleveland.
Pickands, Mather & Co...Cleveland.
Pittsburg Coal Co.....Cleveland.

COAL AND ORE HANDLING MACHINERY.

Brown-Hoisting Machinery Co..... .....Cleveland.

COMPASSES.

Ritchie, E. S. & Son..... .....Brookline, Mass.

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U. S. Graphite Co....Saginaw, Mich.

CONDENSERS.

Great Lakes Engineering Works... ..... Detroit.
Wheeler Condenser & Engineering Co. .....New York.

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Breymann Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Dunbar & Sullivan Dredging Co.... .....Buffalo.
Great Lakes Dredge & Dock Co.... ..... Chicago.
Levine, A. & Co.....Cleveland.
Starke Dredge & Dock Co., C. H... ..... Milwaukee.
Sullivan, M. .....Buffalo.

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Spence Mfg. Co.....St. Paul, Minn.

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Baker & Co., H. H.....Buffalo.
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Columbian Rope Co...Auburn, N. Y.
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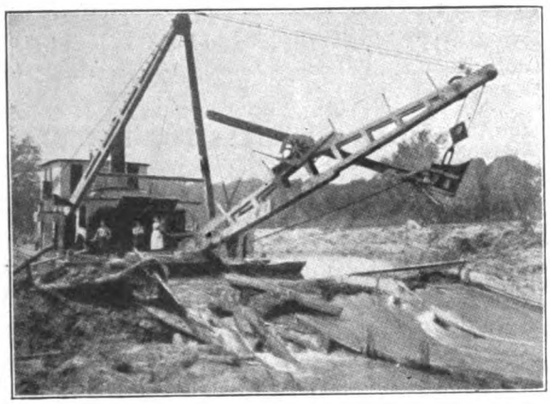

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Centrifugal Pumps, Hoisting Engines, Marine Engines, Machinery for All Uses.

Boom and Crane Castings, Propeller Wheels, etc.

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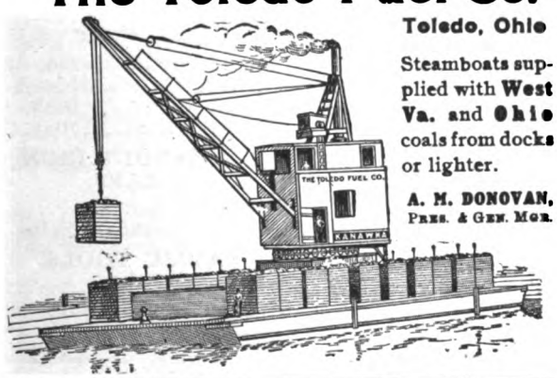

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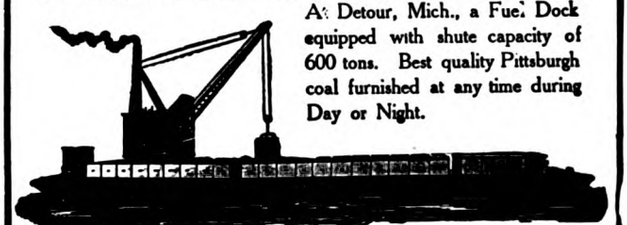

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Lockwood Mfg. Co.....East Boston, Mass.
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Newport News Ship Building Co....Newport News, Va.
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Pickands, Mather & Co...Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B. & Co.....Detroit.
Toledo Fuel Company....Toledo, O.

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Continental Iron Works..New York.

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Safety Car Heating & Lighting Co..New York.

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Lunkenheimer Co.....Cincinnati.

GAGES, STEAM.
Williams Gauge Co.....Pittsburg.

GAGES, WATER.
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Republic Belting & Supply Co.....Cleveland.

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Toledo White Lead Co...Toledo, O.
U. S. Graphite Co....Saginaw, Mich.

GRAPHITE PAINT.
U. S. Graphite Co....Saginaw, Mich.

HAMMERS, STEAM.
Chase Machine Co.....Cleveland.

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Brown Hoisting Machinery Co.....Cleveland.
Chase Machine Co.....Cleveland.
Dake Engine Co.....Grand Haven, Mich.
General Electric Co.....New York.
Hyde Windlass Co.....Bath, Me.
Marine Iron Co.....Bay City.

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Watson-Stillman Co., The.....New York.

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Great Lakes Engineering Works....Detroit.
Roelker, H. B.....New York.

INJECTORS.
American Injector Co.....Detroit.
Jenkins Bros.....New York.
Lunkenheimer Co..... Cincinnati,
Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.
Belcher, Fred P.....Winnipeg.
Brown & Co.....Buffalo, N. Y.
Elphicke, C. W. & Co.....Chicago.
Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mehl, Edward.....Erie, Pa.
Mitchell & Co.....Cleveland.

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